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REVIVAL OF THE COUZENS BILL TO CONTROL COMMUNICATIONS

The telephone interests who thought the Couzens communications commission bill was permanently laid on the shelf last winter, after the Senate hearings, will have to revise this idea. Senator Couzens, who has won his fight for renomination, says he is going back to Washington to resume his efforts to pass the bill which places the telephone, telegraph, radio—in fact, all communications facilities—under the control of a new commission.

He expects a favorable report on the bill by the committee at the regular session beginning in December, and predicts its passage by the Senate before adjournment.

Spokesmen for both the Independent and Bell telephone groups testified before the Senate committee last February and opposed taking the regulation of interstate communications from the Interstate Commerce Commission and giving the control to the proposed new commission.

Other opposition to the Couzens bill developed, and the state commissions also vigorously objected to such federal interference with their jurisdiction. The bill's chances looked pretty slim then, but now Senator Couzens says the fight has only just begun.

* * * *

Senator Couzens discusses the issue at length in the current issue of the Nation's Business. One thing he says which will please the communications interests is that they will not be tangled up with the electric power companies in any federal regulation, as was first proposed. This will help some.

"When the original communications bill was conceived," says Senator Couzens, "it was suggested that it would be advisable to create a commission on communications and power. However, as testimony was developed with reference to the bill it was agreed that it would be better not to link them together. Hence, we abandoned the original plan and we have now adopted the plan of providing for separate administration of communications and power.

"In the next Congress we hope to adopt legislation which will substitute a commission on communications for the existing radio commission, but which will also give to the commission on comunications that authority to regulate wire communications which is now vested in the Interstate Commerce Commission."

* * * *

Independent telephone leaders at the Senate hearings objected to the telephone industry being tied up with the radio business under the new commission. At that time President MacKinnon, speaking for the United States Independent Telephone Association, made this statement:

"The association desires to say that its members prefer to be hitched up with the railroad organizations than to be driven into the same corral with the kicking, biting herd that is known as the radio industry." And he went on to ask that, until the radio industry is stabilized, the telephone industry, which has been stabilized for years, be not hampered and confused by such a relationship as was proposed.

Testimony before the Senate committee showed that 98½ per cent of the telephone business is intrastate, and the telephone representatives, therefore, urged that its regulation be left with the state commissions, while the Interstate Commerce Commission continued to regulate the comparatively small volume of traffic which is interstate.

In short, the telephone interests saw no reason for a new federal commission for communications. But Senator Couzens, who is chairman of the Senate committee on interstate and foreign commerce, says there is.

* * * *

Denying that his bill would make federal authority invade state's rights, Senator Couzens says: "The only additional business which would be regulated by the proposed legislation is the interstate transmission of power. We now have a radio commission which regulates the transmission of energy and communication by radio. The Interstate Commerce Commission has authority to regulate communications by wire.

"It was thought that the regulation of communications, whether by wire or wireless, was better placed under the jurisdiction of one commission. There is much relationship between communications by radio and wire. It, therefore, seems more

logical to have them under the jurisdiction of one commission. The authority of the Interstate Commerce Commission to regulate interstate business in wire communications was long ago granted by Congress, and nothing has happened to indicate that Congress was in error in enacting such a statute.

"The states through their commissions now regulate, and have complete authority to regulate, intrastate movements of power. There is, however, no regulation of the interstate movement of power, yet this movement in some sections is very large. There is no power to regulate interstate commerce except through the federal government, therefore no state regulatory body could regulate interstate communications, either by wire or radio, or regulate interstate power.

"The federal government has exclusive power to regulate interstate business and, when it has done so, it has not been considered an intrusion in business. The people have adopted the theory of either government ownership of monopolies, or government regulation. The preponderance of opinion seems to be in favor of government regulation."

After Holding Companies.

In some quarters the opinion is held that back of the Couzens bill is a desire to acquire more authority over the larger holding companies in the communications field—notably the American Telephone & Telegraph Co. The state of Michigan, which Senator Couzens represents, has had considerable trouble with the Bell organization in connection with rate cases, and has tried to forfeit the charter of the parent company because it would not submit to state regulation.

When asked if his bill planned to control the earnings of communications companies, Senator Couzens said:

"Any regulation of this character looks to such control of utilities as will insure service at fair and reasonable rates. It is not proposed to have this applied to broadcasting companies, because as yet they do not hold themselves out as public utilities. The time does not appear to have arrived when broadcasting companies could be so designated, therefore no attempt is being made to control earnings or rates of service of broadcasters."

* * * *

The interviewer also asked Senator Couzens this question: "What argument is there for preserving the competitive aspects of international communications and at the same time permitting the practical monopoly that exists in the domestic telephone situation?"

In reply, Senator Couzens says: "The first answer repeatedly given before our committee was that fair rates and service to the public could be insured through only one of two methods—competition or regulation.

"Immediately the question arises as to how this country can regulate and control rates or service internationally. It was contended that the only protection the public could have was through competition. On the other hand, a domestic communications company can be regulated and controlled by the states, where the business is intrastate, and by the federal government where the business is interstate."

* * * *

In view of the manufacturing factor in the radio, telephone and other utility fields, Senator Couzens' comments on this point are of interest.

"The existing radio law," says he, "provides that there shall be no merger of wire and wireless facilities where the effect would be materially to lessen competition. Behind that clause in the law were two causes.

"One cause was the agreement that radio is a new art, and that it should be encouraged and permitted to develop without restraint. Unless it were protected, there was danger that wire comunications companies would get control of radio and endeavor to protect their investments by hampering the utilization and development of radio.

The other cause was that radio-communications companies were associated intimately with the manufacturing companies. A monopoly here might prove dangerous. For example, suppose that in the first days of transportation by railroads, one road had obtained all the controlling patents on the steam engine and then was permitted to manufacture only for itself.

The result would have been an absolute monopoly in transportation and manufacture, and it is doubtful that our railroads would have developed as they have. Those interested in radio desire to insure the utmost freedom for its development.

In practically every form of public service companies a monopoly is compatible with public interest where it is possible to insure absolute protection of the public through regulation and control. However, where one form of utility is confronted by an entirely new form of utility, it is essential to see that the new utility is given every opportunity to develop."

Stricter Regulations.

The advocates of government ownership of utilities will probably disagree with Senator Couzens' belief that, for the present, at least, the general public is indifferent if not cold to their pet hobby. His position is that, to protect the public, utility monopolies must either be regulated or owned and operated by the government. In his opinion, at this time the people are not in favor of government ownership. Therefore there must be more adequate regulation.

The manufacturing and merchandising activities of public service companies will also come in for scrutiny at Washington. Just what relation these activities bear to the anti-trust laws, and to the charter powers bestowed on certain utility corporations, will be among the questions to be determined. Some agitation of these issues has already begun in several states, notably in Ohio, Wisconsin and Oklahoma.

COMING CONVENTIONS

United States Independent Telephone Association, Hotel Stevens, Chicago, Ill., October 14, 15, 16 and 17.

Independent Pioneer Telephone Association of United States, Stevens Hotel, Chicago, Thursday, October 16.

Illinois Telephone Association, Pere Marquette Hotel, Peoria, November 12 and 13.

Missouri Telephone Association, Hotel President, Kansas City, November 18 and 19.

Canadian Independent Telephone Association, Prince George Hotel, Toronto, November 25 and 26.

South Dakota Telephone Association, Sioux Falls, January 13, 14 and 15, 1931.

Nebraska Telephone Association, Lincoln, Hotel Lincoln, February 10, 11 and 12, 1931.

Texas Independent Telephone Association, Fort Worth, Texas Hotel, March 17, 18 and 19, 1931.

Iowa Independent Telephone Association, Hotel Fort Des Moines, Des Moines, April 7, 8 and 9, 1931.

Annual Meeting of Independent Industry

National Convention of United States Independent Telephone Association to Be Held Next Week in Chicago—Program Events Indicate Much Discussion of Important Matters—Toll Business Center of Interest—Many Exhibits

The national convention of the Independent telephone industry in Chicago each year has attracted a larger attendance and a greater number of exhibits of telephone equipment apparatus, materials, and supplies, than the preceding one. Last year, the necessity for larger exhibit space and accommodations was recognized and the convention was held at Hotel Stevens. The attendance was in the neighborhood of 1,200, the greatest ever recorded at a national meeting.

This year's convention undoubtedly will uphold the standards attained last year and probably establish new records. The meeting will be held at Hotel Stevens, Chicago, commencing on Tuesday, October 14, and concluding on Friday, October 17. The program as announced is more than ordinarily attractive, not only to the department heads but also to the rank and file of the industry.

The opening session on Tuesday afternoon will be given over to strictly association business. The program provides for the reports of the officers and the chairmen of the various divisional activities of the association.

Interest in this session naturally will center upon the annual address of President F. B. MacKinnon. His annual statements of conditions and problems of the industry have always been clear-cut and to the point. With the different conditions now prevailing, his address this year will undoubtedly be of even greater interest than usual.

The Wednesday morning session of the convention will be a general one, devoted mainly to the discussion of the toll lines and toll business.

T. De Witt Talmage, transmission engineer of the Illinois Telephone Association, will discuss the toll lines from the transmission maintenance point of view. H. H. Wheeler, Jr., chief engineer of the Lincoln Telephone & Telegraph Co., Lincoln, Neb., will consider construction requirements, while R. F. Wilder, general commercial manager of the Tri-State Telephone & Telegraph Co., St. Paul, Minn., will discuss the economic value of toll lines to Independent companies.

Division conferences will occupy Wednesday afternoon. The accounting, plant and traffic divisions will each hold separate meetings. Many managers are interested in the programs of both plant and commercial divisions, so the conference of the commercial division will not be held until Thursday. Thus opportunity is afforded those who desire, to listen to discussions of both the plant and commercial divisions. The conference of the commercial division will take place on Thursday morning commencing with a breakfast at 8:30 o'clock.

At 10:00 a. m. on Thursday, the annual meeting of the Independent Pioneer Telephone Association of United States will open. The program will consist of the reports of officers and the election of officers and directors, followed by short talks by several of the old Pioneers.

The annual luncheon and entertainment of the Pioneers at noon promises to be more largely attended than ever before. The entertainment committee has provided what is believed to be the finest program so far presented, and everyone at the convention will want to be present.

On Friday morning, the executives of the various state associations will meet for breakfast and discuss the general topic of cooperation between state associations. The accounting division and the traffic division will hold round table discussions. These meetings will be followed by a general session at 9:30, at which miscellaneous business will be taken care of.

The balance of the morning will then be given over to the conference of the program service division. The papers which will be presented will touch upon various phases of program service. The speakers will be John A. Gustafson, Geo. B. Quatman, Frederic C. Young, A. L. Geiger, Oscar C. Levy, and W. H. Hutter.

The concluding event of the program is the address and demonstration by Sergius P. Grace, assistant vice-president of the Bell Telephone Laboratories, New York City, at a luncheon of the Illinois Manufacturers Association at 1 o'clock on Friday. Arrangements have been made so that telephone people desiring to hear Mr. Grace's exposition of the latest developments in the laboratory may have special tables reserved for them.

The program indicates a busy week for those attending the convention. Not only will they obtain much valuable information from the various addresses and discussions, but the exhibitors will show a number of new developments that have just been announced. The exhibits at the national convention comprise a most valuable educational feature, affording telephone people opportunity to readily and quickly obtain first-hand information.

EXHIBITORS AT NATIONAL CONVENTION

Acme Card System Co., Chicago.
American Electric Co., Inc., Chicago.
Automatic Electric Inc., Chicago.
W. M. Bashlin, Inc., Grove City, Pa.
L. M. Berry & Co., Dayton, Ohio.
Lynton T. Block & Co., St. Louis, Mo.
Bond Electric Corp., Jersey City, N. J.
Churchill Cabinet Co., Chicago.
Coffey System & Audit Co., Indianapolis, Ind.
Coffing Hoist Co., Danville, Ill.
Cook Electric Co., Chicago.
Curtin-Howe Corp., New York.
Ekko Co., Chicago.
Electric Storage Battery Co., Chicago.
Everhot Mfg. Co., Maywood, Ill.
Everstick Anchor Co., St. Louis, Mo.
Do/More Chair Co., Elkhart, Ind.
Fansteel Products Co., Inc., North Chicago, Ill.
French Battery Co., Madison, Wis.
General Dry Batteries, Inc., Cleveland, Ohio.
Highway Trailer Co., Edgerton, Wis.
Holtzer-Cabot Electric Co., Chicago.
International Forest Products, New York.
J. K. Johnston, Indianapolis, Ind.
Joslyn Mfg. & Supply Co., Chicago.
James R. Kearney Corp., St. Louis, Mo.
Kellogg Switchboard & Supply Co., Chicago.
Kester Solder Co., Chicago.
Leich Electric Co., Genoa, Ill.
National Carbon Co., New York.
National Fire Proofing Corp., Pittsburgh, Pa.
North Electric Co., Galion, Ohio.
Page & Hill Co., Minneapolis, Minn.
Philadelphia Storage Battery Co., Philadelphia, Pa.
Quick Directory Co., Indianapolis, Ind.
Reliable Electric Co., Chicago.
Runzel-Lenz Electric Mfg. Co., Chicago.
John A. Roebling's Sons Co., Trenton, N. J.
Sands Electric Co., North Chicago, Ill.
Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.
Suttle Equipment Co., Lawrenceville, Ill.
Templeton, Kenly & Co., Ltd., Chicago.
Unique Mfg. Co., Inc., Chicago.
U. S. L. Battery Corp., Niagara Falls, N. Y.
Wagner Directory Co., Freeport, Ill.
P. Wall Mfg. Supply Co., Pittsburgh, Pa.

PROGRAM

United States Independent Telephone Association, Thirty-Fourth Annual Convention, October 14-17

Hotel Stevens, Chicago

TUESDAY, OCTOBER 14, 9:30 A. M.

Annual Meeting of Board of Directors.

Opening of Exhibits. Registration of Members and Visitors.

GENERAL OPENING SESSION, TUESDAY, 2:30 P. M.

Report of Secretary-Treasurer, by Chas. C. Deering, Des Moines, Iowa.

Report of Chairman of Plant Division, by A. L. Stadermann, Chief Engineer, Citizens Independent Telephone Co., Terre Haute, Ind.

Report of Chairman of the Program Service Division, by L. O. Painter, Chief Engineer, Program Service Co., St. Paul, Minn.

Report of Traffic Division, by Roy F. Mapes, Traffic Superintendent, Jamestown Telephone Corp., Jamestown, N. Y.

Report of National Counselor to United States Chamber of Commerce, by E. D. Glandon, President, Pike County Telephone Co., Pittsfield, Ill.

President's Annual Report, by F. B. MacKinnon, Chicago.

Appointment of Convention Committees. Miscellaneous Business.

GENERAL SESSION, WEDNESDAY, OCTOBER 15, 9:30 A. M.

"Transmission Maintenance of Toll Lines", by T. De Witt Talmage, Transmission Engineer, Illinois Telephone Association, Springfield, Ill.

"Toll Line Construction Requirements", by H. H. Wheeler, Jr., Chief Engineer, Lincoln Telephone & Telegraph Co., Lincoln, Neb.

"Economic Value of Toll Lines to Independent Companies", by R. F. Wilder, General Commercial Manager, Tri-State Telephone & Telegraph Co., St. Paul, Minn.

Reports of Committees. Election of Directors. General Business.

DIVISION CONFERENCES, WEDNESDAY, 2:00 P. M.

Accounting Division:

Discussion of Proposed Changes in Interstate Commerce Commission Accounting Classifications, by F. A. Barnes, Assistant Director, Bureau of Accounts, Interstate Commerce Commission, Washington, D. C.

Plant Division:

Report of Committee on American Standard Electrical Definitions, by Arthur Bessey Smith, Chief Research Engineer, Automatic Electric Inc., Chicago.

"A National Switching Plan for Toll Telephone Service and the Transmission Requirements", by A. L. Stadermann, Chief Engineer, Citizens Independent Telephone Co., Terre Haute, Ind.

Traffic Division:

Visit to offices of Illinois Bell Telephone Co., Chicago, where program will be presented, explaining operating instruction procedure of the Illinois Bell company, followed by an inspection of other departments.

COMMERCIAL DIVISION CONFERENCE, THURSDAY, 8:30 A. M. (Breakfast)

General Survey of Commercial Activities of the Independent Group, Through Reports by District Chairmen.

ANNUAL MEETING OF MEMBERS OF INDEPENDENT PIONEERS' ASSOCIATION, THURSDAY, 10:00 A. M.

ANNUAL INDEPENDENT PIONEERS' LUNCHEON AND ENTERTAINMENT, THURSDAY, 1:00 P. M.

ANNUAL CONFERENCE OF STATE ASSOCIATION EXECUTIVES, FRIDAY, OCTOBER 17, 8:30 A. M. (Breakfast)

General Topic: "Co-operation Betweeen State Associations." Discussions by A. J. Parsons, Secretary-Treasurer, Illinois Telephone Association, Springfield, Ill., and W. H. Beck, Secretary-Treasurer, Indiana Telephone Association, Indianapolis, Ind.

Accounting Division Conference: Round Table.

Traffic Division Conference: Round Table.

GENERAL SESSION, FRIDAY, 9:30 A. M.

Miscellaneous Business.

PROGRAM SERVICE DIVISION CONFERENCE, 10 A. M.

"Features of Program Service which Appeal Most to Present and Prospective Subscribers", by John A. Gustafson, Manager, United Electric Service Co., Abilene, Kans.

"Advertising and Sales Methods and Comparison Between Radio and Program Service", by Geo. B. Quatman, Vice-President, The Utilities Service Co., Lima; Ohio.

"Ultimate Systems for Program Service and What the Future Holds", by Frederic C. Young, Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y.

"Changes in the Patent and Copyright Situation", by A. L. Geiger, General Attorney, U. S. Independent Telephone Association, Washington, D. C.

"Multiple Program Service for Smaller Cities", by Oscar C. Levy, Development Engineer, Automatic Electric Inc., Chicago, Ill.

"New Developments in Program Service Amplifiers and Loud Speakers", by W. H. Hutter, Chief Engineer, Radio Division, Webster Electric Co., Chicago, Ill.

Questions and General Discussion.

FRIDAY, 1:00 P. M.

Luncheon followed by Demonstration of Latest Discoveries of Bell Telephone Laboratories, by Sergius P. Grace, Assistant Vice-President, New York City.

A New Large International Organization

Theodore Gary & Co. and the Transamerica Corp. Join in International Development Project—Will Actively Extend Foreign Operations of Associated Telephone & Telegraph Co.—Important British Interests Are Also Included

Large expansion of the international telephone, manufacturing and other public utility activities of Theodore Gary & Co. is indicated by statements given out on October 6 announcing the formation by the Gary company in affiliation with the Transamerica Corp. and with important British interests, of the General Telephone & Electric Corp., a potential 250-million dollar corporation for telephone and electrical operations outside of the United States.

Controlled by Gary Interests.

The new company, which will be controlled by the Gary interests, will start business within the next few days with capital and surplus of more than 25 million dollars, of which the Gary interests and the Transamerica Corp. are taking more than 20 million dollars for their own permanent investment while British and other associates are taking approximately six million dollars.

The purpose of the new company will be to extend and finance the Associated Telephone & Telegraph Co., the international telephone manufacturing and utilities company organized in 1926 and sponsored by the Gary company. This company has, in the short time since its organization, acquired and is now operating properties to the value of more than 75 million dollars. TELEPHONY of July 26 gave a complete outline of its varied activities.

Theodore Gary & Co. is an organization of international prominence in the telephone field. For some 30 years the company has controlled and operated Independent operating properties in the United States. For a number of years they have controlled manufacturing companies both in this country and abroad, including Automatic Electric Inc., manufacturing the automatic telephone, American Electric Co. Inc., and a number of other factories.

The activities and success of the Gary organization and its standing and prestige in the Independent telephone field in the United States are so well known to all telephone men that it is unnecessary to review them. This great expansion in foreign fields is a natural development for this organization, which represents what is probably the most important Independent aggregation of telephone experience and skill in the world.

Factors in the Combination.

The combination in the new General Telephone & Electric Corp. of the long experience and technical skill of the Gary organization in telephone and electrical fields throughout the world, plus the large financial resources of the Transamerica Corp. and its own affiliated organizations throughout the world, it is believed, assures not only the rapid but the successful growth of Associated Telephone & Telegraph Co. in the telephone and electrical field.

The statement officially authorized by Theodore Gary & Co. and made public in Chicago on October 6 by Executive Vice-President E. C. Blomeyer, follows:

"The entry of Transamerica Corp., the world's largest financial holding company, into the field of international telephony was made known today by the announcement of the immediate formation of the General Telephone & Electric Corp. by Theodore Gary & Co. and important British interests, in alliance with Transamerica. The Gary company, with principal offices in Kansas City, Chicago, New York and London, owns and operates extensive telephone systems and allied manufacturing plants in the United States and other countries.

Purpose of Corporation.

"The General Telephone & Electric Corp., combining the Transamerica Corp.'s resources and the Gary organization's experience and technical skill, is created primarily for the extension and enlarged development outside the United States, of the business of Associated Telephone & Telegraph Co., now controlled and managed by the Gary interests and British associates, with headquarters at Chicago. The newly-formed corporation and the interests sponsoring it, will control and operate, with the exception of the Bell system, more telephones than any other privately-owned company.

Bringing the Transamerica Corp. and the Associated Telephone & Telegraph Co., the latter with established operations in many countries, into the relationship represented by the General Telephone & Electric Corp. is regarded as forecasting for the latter a role of outstanding prominence in the manufacture, installation and operation of telephone systems outside the United States.

The authorized capital of the General Telephone & Electric Corp. is 5,000,000 shares of common stock. For their permanent investment the Gary interests and the Transamerica Corp. are taking over $20,000,000, while British and other associates are taking approximately $6,000,000, all in common shares at $50 each. No public financing is contemplated at present.

The Associated Telephone & Telegraph Co., itself an alliance of British, Canadian and American financial interests and now operating telephone systems and manufacturing plants supplying essential equipment, was organized by the Gary interests and holds properties of approximately $75,000,000 in value.

The Associated company owns control of, or has substantial interests in properties located in the United States, England, Canada, Philippines, Colombia, Venezuela, Belgium, Portugal, India, Hongkong, Australia and other countries. Negotiations are now in progress for the establishment of manufacturing facilities in France.

Products of Manufacturing Branches.

"The company has received world-wide recognition of the products of its manufacturing organizations, and especially of its Strowger automatic dial system.

Nearly three-fourths of the world's automatic telephones are connected to central offices equipped with this mechanism, or modifications based upon its original design. The United States government and the Bell system use the Strowger system extensively, and it is used exclusively in the telephone systems of Canada, both by the government and the Canadian Bell company.

It is also used exclusively in Great Britain, Germany, Australia, Japan, Argentina, Cuba and Portugal. Among the many cities equipped with the Strowger system are London, Berlin, Rome, Sydney, Havana, Buenos Aires, Tokio, Honolulu, Harbin, Darien, Bombay, Orleans and Nice.

The Liverpool plant of the Associated Telephone group was awarded the initial contract for the construction and installation of automatic equipment for the immense telephone network of greater London, the completion of which will require a decade."

Officers of New Corporation.

H. L. Gary, president of the Theodore Gary & Company, will become chairman of the General Telephone & Electric Corp. Its president will be A. F. Adams, now chairman of the Gary company. Elisha Walker, chairman of the Transamerica Corp., will serve as chairman of the executive committee of General Telephone, which committee will also include Jean Monnet, vice-chairman of Transamerica.

E. C. Blomeyer, of Chicago, now executive vice-president of Theodore Gary & Co. and Rene Pleven of Paris, will become vice-presidents of General Telephone.

In addition to the foregoing officers, the directorate will include Sir Alexander Roger of London; W. F. Benoist, presi-

(*Please turn to page* 52.)

Salesmanship; Another Point of View

View of Telephone Salesmanship Most Frequently Discussed Briefly Outlined—Another View Which Discusses the Principle of Understanding Relationship Between Telephonic Communication and Trends of the World of Commerce

By Robert O. Caulkins,

Southwestern Bell Telephone Co., Wichita, Kans.

It seems to me that there are two points of view from which the question of salesmanship can be considered.

Much that I have read and heard on this subject has been from one of these two points of view. It has to do almost entirely with distinguishing the qualifying characteristics of a salesman, with the psychological process of developing and closing a sale, and with a thorough knowledge of the article or service that we offer for sale.

We telephone salesmen are told that there are ten character qualifications the presence of which make for a successful career. We should be adaptable, moral, sincere, loyal, courageous, dignified, accurate, earnest, courteous, and of sound judgment. That this is true when applied to anyone in any walk of life is patent. It is the basis, the major premise, in any career.

Psychological Steps in Sale.

We learn further that there are five psychological steps in a sale. We must first secure the prospect's attention; that is, by a favorable first impression we are to direct his attention to what we have to sell. The way we dress, the manner of our speech, our courtesy, dignity and sincerity, all bear on this first impression.

Second, we must arouse his interest. To do this often necessitates prior information as to the prospect's likes and dislikes. With this information we can present our proposition in its most favorable light.

Third, we must awake in the prospect a desire to possess the particular grade of service we are offering him. We do this by pointing out the benefits that will accrue to him through the use of our service.

Fourth, we must plant a conviction in the prospect's mind—a conviction that our service will bring him the best results. This we can do largely in overcoming his objections.

Fifth, and last, we must incite him to action. This is done by rekindling his desire to possess our service *now*. He is either going forward or he is going backward; to put off that which is to his advantage in every way to possess, is to go backward.

Of course, before attempting to make a sale we must "know our stuff." We should have as complete a knowledge as possible of the grades and types of service we have to offer the consumer; residence and business service, types of telephone equipment, wiring plans, intercommunicating systems, P. B. X. and P. A. X. systems, semi-public and public telephone service, toll terminals, special equipment, directory listings, etc., etc.

In addition to a knowledge of our service, we must know the rates and charges as contained in the local tariff. Not only that, we must have a working knowledge of the inter-relationship of our company's plant, traffic, accounting, and commercial departments. Efficiency in performance depends in a large measure on the co-ordinating efforts of every individual in every department.

Some Questions.

I have repeated the foregoing with the purpose, not of boring anyone or of adding or changing which has already been written by others more capable than I, but of asking a few questions.

It is not the old, old story of the cart before the horse? And where is the horse?

It is as though, in the field of human relationship, one were to spend all his time in teaching little Willie not to slam the door, not to pull pussy's tail, and not to fight or to imitate escaping steam when eating his soup. That is one point of view. The other is that the basis of human relationship is a consideration for the feelings of others and that the foregoing standards of behavior are but tools to be used in attaining that end.

What is the object of our telephone sales efforts? To increase the company's revenue? Obviously, but how are we to increase our company's revenue? What is the basic principle underlying any such increase?

It seems to me that that underlying principle is an understanding of the relationship between telephonic communication on the one hand and the trends of the world of commerce on the other. The telephone industry is at the very heart of the business world and of civilization itself, for the very reason that progress in the fields of human endeavor depends in such a large measure upon the ease, speed and economy of a system of communication.

Thoughts to Consider.

We telephone salesmen have but to consider the far-reaching effects of the annihilation of time and space by the telephone on the consolidation of the United States. At the present time we are playing a part in an even mightier drama as well—international relationships. Business men in all parts of the world will soon be no farther from one another than they are from their respective telephones.

We are not selling wiring plans, P. B. X. systems, etc.; we are selling intercommunication. Our equipment is but its tangible modus operandi. What concerns us primarily then, as telephone salesmen, are business conditions, statistics, and trends.

For example, suppose that we were to learn that 82 per cent of a certain department store's customers remain inactive for a period of from one to ten years. One-eighth of these former customers quit because of complaints not adjusted, and in most cases not even voiced. The probability is that 95 per cent of these can be uncovered, adjusted, and rewon. Seven-eighths of these former customers quit for no good excuse at all. There is reason to believe that enough of these can be brought back into the fold to be highly remunerative.

Selling Problem Analyzed.

The problem now resolves itself into two parts. First, what can be done to regain that potential of 82 per cent? And second, what can be done to reduce the number of customers who quit?

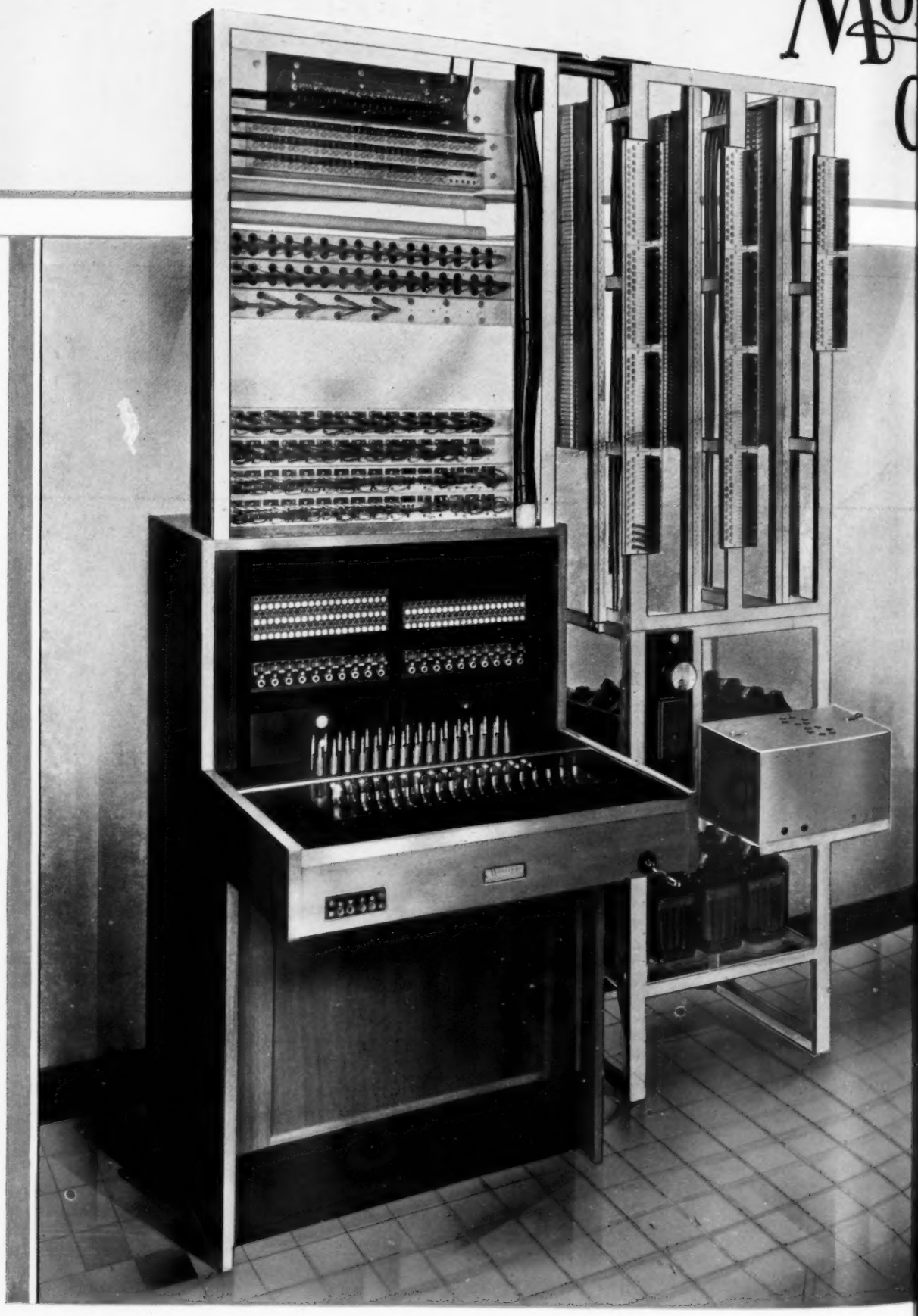
The answer, I believe, to both questions is: Personal contact between the management of this particular department store and its customers, past and present.

Our function, then, as telephone salesmen, is to correlate telephone service to this situation. Our character qualifications, our ability to develop and close a sale, our knowledge of equipment, tariff, and commercial practice are but tools to this end.

The logic of this position seems to me to be borne out by the fact that in legitimate industry high-pressure salesmanship is a thing of the past. Wholesale houses no longer stock up their customers with all the goods their shelves will hold regardless of their customer's needs. And this reversal of business practice has not been the result of a sudden flow of the milk of human kindness in the wholesaler's veins. Any tactics that ignore the needs of the consumer simply does not pay.

Likewise, our efforts to increase our company's annual revenue would eventually end in defeat were we to remain in ignorance of the major problems confronting the business world today. And those problems are happily our problems. The late Theodore N. Vail once said: "It is the meeting and overcoming of difficulties that bring out our latent ability, and the very existence of these troubles and difficulties affords us our opportunities." Allons!

Announcing the NEW. . .



ype Community

U.S.PAT. OFF.

ral Battery Switchboard

USHERING in a new era of service to the small exchange—and a new period of prosperity for the small telephone company—the Monotype Community common battery switchboard is the most outstanding achievement in manual switchboard development in a decade.

With this new unit the small telephone exchange can now provide its patrons with the fast, accurate telephone service which has been denied to them for so many years. With this new unit, the small exchange can now enjoy the financial rewards of such service. Designed to fit both the operating requirements and the financial structure of the small exchange, the Monotype Community switchboard is a triumph of modern telephone engineering design.

Technical innovations—such as the combined steel switchboard frame and relay rack—the combined distributing and protector frame and power equipment mounting—reduce the size of this unit to a point where it requires but little more space, if any, than the magneto equipment it replaces. The extraordinary simplicity and accessibility of the unit assures satisfactory operation and maintenance with the same personnel now operating the magneto apparatus. Even more important that these points is the fact that the ingenuity of the design permits mass production of these units, so that their first cost is well within the financial limitations of the small exchange.

For every telephone executive or administration operating a magneto exchange of less than 400 lines, the Monotype Community has a story that will mean greater satisfaction to its patrons and a more substantial return on its investment. Full technical description, circuits, and other details of this switchboard can be had by writing for Bulletin 104. Or, if possible, visit the American Electric exhibit at the convention of the United States Independent Telephone Assocation at the Hotel Stevens, Chicago, on October 14, 15, 16 and 17.

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Incomparable

The Monophone

AS the merit of a telephone is proved by its use, the popularity of the Monophone mounts as the number installed increases. Thus it is that the Monophone constantly fortifies its supreme position among telephones as the ratio of increase in installations accelerates month after month.

The "why" of the extraordinary success of the Monophone is not difficult to answer. It is simply due to the fact that the Monophone brings a greater mutual satisfaction to both the telephone user and the telephone company than does any other telephone instrument. While it is true that the beauty, convenience and "talking qualities" endear it especially to the user, and while it is likewise true that the transmission efficiency and durability of the Monophone appeal especially to the telephone manager, yet, it is also true that the Monophone combines all these desirable attributes of a telephone to a degree unapproached by any other telephone instrument of either the past or present.

Equally important is the fact that the wide range of styles of the Monophone places virtually no limit upon its application. It is available in a variety of circuit arrangements for both desk and wall mounting for working with either common battery or magneto central office equipment. Bulletin 100 both illustrates and describes all types of Monophones. Copies of this bulletin will be furnished upon request.

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Purpose of the Manual Tandem Board

Use of Tandem Switchboard in Large Multi-Office Areas Reduces Number of Trunks But Requires Installation of Better Facilities to Meet Transmission Standards—Tandem Board Operated on the Straight-Forward-Trunking Basis

By C. G. Spencer,
Member of the Technical Staff, Bell Telephone Laboratories

In a very small community it would be possible to have telephone service without a central office by running lines from each subscriber to every other subscriber, and by having a simple switching arrangement in each home so that a subscriber could select the line he wanted to call.

With this arrangement in a community of eight homes, there would be a total of 28 connecting lines, and for each station there would be required one plug connected to the telephone and seven jacks connected to the lines to the other subscribers; in all there would thus be eight plugs and 56 jacks.

If a central office were installed, only one line would be required from each subscriber to the office—or a total of eight lines in place of the 28 of the former arrangement; and only eight jacks, one for each line—instead of 56 before. The number of plugs required would depend on the number of calls that might be placed at any one time, which could not be more than four, so that the maximum would be eight plugs.

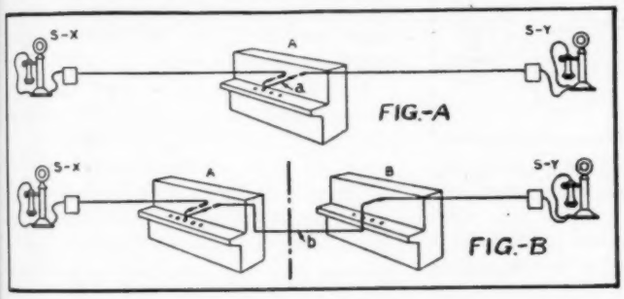


Fig. 1. In Single-Office Areas Two Subscribers Are Connected by a Single Cord Circuit Terminated in Plugs at Each End; Multi-Office Areas Require Both "A" and "B" Switchboards in Each Office of the Exchange and Thus an Additional Link and Connecting Operation Become Necessary.

The installation of a central office thus produces a great economy in both lines and switching equipment. In any but the very smallest communities, the expense and complexity of a system without a central office would be so enormous that the possibility of installing such a system would not be given a second thought. A service comparable to that performed by a central office for a group of subscribers, is performed by the tandem board for a group of central offices. It reduces both the number of inter-connecting trunks and the amount of switching equipment in the central office.

In a district having but a single central office, a complete connection consists only of a link connecting two subscribers' lines, represented diagrammatically in Fig. 1-A. Here *S-X* represents a calling subscriber's station, *S-Y* a called subscribers' station, and *a* the connecting link or cord circuit. The latter consists of a repeating coil arranged to feed battery current to the transmitters of both stations, a supervisory relay for each end of the cord circuit, and the necessary lamp signals.

The complete connection is handled through a single switchboard, which for convenient reference is called the "A" switchboard. As the number of telephones in an area increases, there comes a time when all connections can not be made in this manner because of physical limitations in the size of the switchboard. Additional offices, therefore, are provided and trunk circuits are introduced between the cord circuit shown in Fig. 1-A, and the called subscriber's station.

This connection is shown schematically in Fig. 1-B, where *S-X* and *S-Y* represent the calling and called subscribers, *a* the connecting cord circuit, *b*, the additional circuit which serves as a connecting link in the transmission system between two offices. This consists of a jack at the originating end, a repeating coil with the necessary control relays for transmitting the supervisory signals from the called station to the originating "A" operator, and a plug at the terminating end.

This scheme introduces a new type of switchboard section, and requires space in the "A" board for a group of jacks known as the outgoing trunk multiple. The new type of switchboard section, at which calls from other offices are completed, is called the "B" switchboard for convenience in distinguishing it from the "A" switchboard just referred to.

This system may be applied to a considerable number of offices, but requires a group of trunk circuits from each office to every other office of the group. It is known as direct trunking. Fig. 2 shows a direct trunking diagram between four offices.

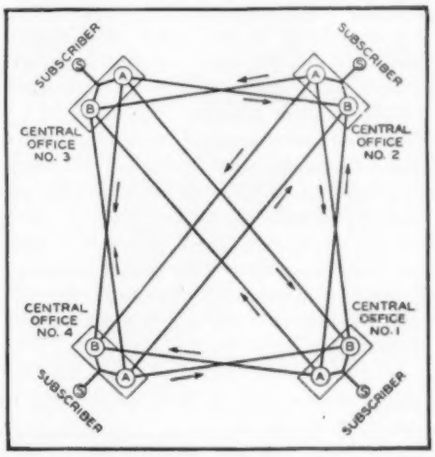


Fig. 2. Between Each Office in a Multi-Office Area Two Groups of Trucks Are Required, Each Group Connecting the "A" Board of One Office With the "B" Board of the Other.

The direct-trunk method in large multi-office areas brings serious losses in trunk efficiency. It is necessary to provide a sufficient number of trunks between each pair of offices to care for the maximum number of calls being made at any one time; and, since the busy periods between an "A" board and the various "B" boards may not coincide, there will probably be at all times a considerable number of idle trunks. If inter-office connections could be made through a common central point, however, the number of idle trunks would be materially reduced.

In Fig. 3, such a central switching point

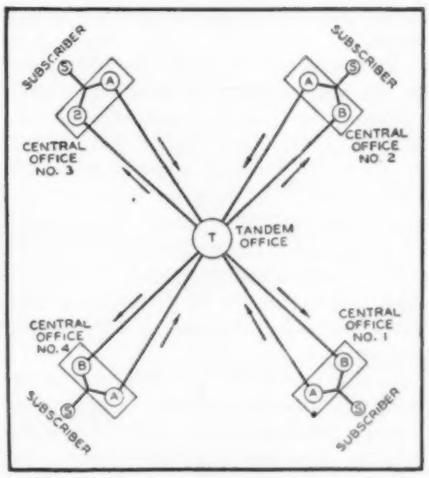


Fig. 3. When a Tandem Is Used Instead of Having Two Groups of Trunks from Each Office to Every Other Office, Only Two Groups to the Tandem Are Required.

is shown, and in Fig. 4 the switching arrangements for a single cell are represented diagrammatically. This system, frequently met with in large areas, is generally referred to as the tandem system.

While the choice between direct and tandem operation is partly determined on the basis of trunk efficiency, it is also affected by the cost of providing facilities of a grade necessary to meet transmission standards. Tandem operation usually involves a longer length of circuit than direct trunking in addition to the tandem office equipment, so that to meet comparable standards a better grade of facility is required for the tandem trunks.

For tandem operation to prove advisable, therefore, the increased efficiency should offset the cost of better trunks, so that the total cost of the plant to care for the traffic considered, is less with tandem operation than with direct trunking. Actually, transmission standards for direct trunking are slightly better than for tandem operation.

In Fig. 4, *S-X* and *S-Y* represent the calling and called stations; as before, *a* the cord circuit; *b* a trunk very similar to the one described in connection with Fig. 1-B, except that the signaling arrangements are somewhat modified, and the tandem trunk. Here the "A" operator selects an idle trunk to the tandem office and, receiving a signal that the tandem operator is connected, passes only the name of the called office to the tandem operator. The tandem operator selects an idle trunk to the desired office and plugs into the jack, her set being then automatically disconnected.

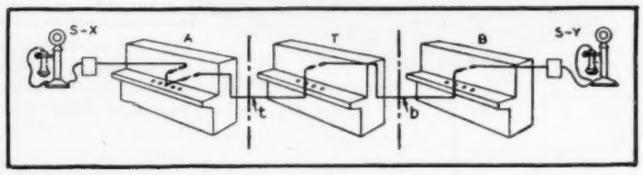


Fig. 4. Tandem Operation Introduces a Third Link and Operation, But It Greatly Reduces the Equipment and Trunks Required.

Once disconnected, the tandem operator has no means of again getting in on the connection and has no further duties to perform until a disconnect lamp indicates to her that the connection should be taken down.

The reduction in trunks brought about by the tandem board is sometimes greatly enhanced by favoring geographical conditions. Occasionally there are two adjacent areas between which considerable traffic exists. If each of these areas is served by a tandem board, an economy of trunks may be brought about by running a common group between the two tandem boards instead of separate groups from the tandems to each of the offices in the other area.

Double tandem is not considered an entirely satisfactory method of operation, however, because of the delay on the call and the increased chance of error. Because of these service reactions and because of the relatively small savings brought about by the double tandem method of operation when the traffic has reached any sizeable proportions, this method is used only between points where the normal traffic is small.

Since the introduction of straight-forward trunking, the tandem switchboard has come to be used to a greater extent as a means of providing for toll service between adjacent sections.

It has enabled telephone companies to materially extend the range of their "A" to "B" toll service. The connections are handled on a call-by-number basis, the "A" operator making out the ticket and timing the call. The traffic is handled in the same manner as regular inter-office business except for the tickets and timing, and the connections are made with little delay.

The tandem switchboard is also used as a means of rerouting calls during periods of light load in order to bring all calls into a few adjacent positions, known as night positions at the "B" board. This materially reduces the number of operators required for light load periods.

The arrangement is possible because trunks from a tandem board are, as a rule, located in one or two positions at the head of the trunk switchboard, which gives somewhat the same effect as having a small trunk group from each office coming into the position at the head of the trunk switchboard.

The present standard tandem switchboard is operated on a straight-forward-trunking basis using the automatic-listening method. Each position consists of an operator's telephone set, a positional control circuit, and 60 trunk circuits. As a call comes in on a trunk, a lamp lights to indicate that a call is waiting.

The trunks with waiting calls are connected in numerical sequence to the operator's telephone circuit by means of a chain of relays. Three short impulses of tone are sent, by relays in the control circuit, to the "A" operator to indicate that the tandem operator is ready to receive her order, and a small portion of this tone is by-passed to the tandem operator, warning her to be prepared to receive the order. The lamp signal on the connected trunk is automatically flashed to indicate the trunk to which the operator is connected.

To avoid the necessity for making busy tests at the tandem board, the outgoing trunks are equipped with idle trunk-indicating lamps. A lamp is kept burning over the jack of the lowest numbered idle trunk in a group to a particular office, and the tandem operator may plug into the jack under that lamp without testing it. As soon as the operator does this, the indicating lamp is extinguished and the lamp of the next lowest numbered idle trunk is lighted.

At present there are over 20 manual tandem switchboards in the United States, seven of which are of the standard automatic listening type. In the New York area there are three manual and two mechanical tandem boards. Here a number of calls require double tandem operations as the connection may be routed through two tandem offices.

United States Civil Service Examination for Telephone Engineer.

The United States Civil Service Commission announces an open competitive examination for assistant telephone engineer, applications for which must be on file with the commission at Washington, D. C., not later than November 5. The entrance salaries range from $2,600 to $3,200 a year. This examination is to fill vacancies in the office of the chief signal officer, Washington, D. C., the signal service at large, Fort Monmouth, N. J., and throughout the United States. Competitors will not be required to report for examination at any place, but will be rated on their education, training, and experience.

Applicants must show that they have been graduated with a degree in engineering, preferably electrical or telephone engineering, from a college or university of recognized standing, upon the completion of at least 118 semester hours' credit. Two years of certain specified engineering experience may be substituted for two years of the education requirement. In addition applicants must show that they have had at least two years of progressive professional experience in an engineering position, or postgraduate college study, in the field of telephone engineering.

Full information may be obtained from the United States Civil Service Commission, Washington, D. C., or from the secretary of the United States civil service board of examiners at the postoffice or customhouse in any city.

Australia Connected by Telephone with Nearly All of Europe.

The wireless telephone service between England and Australia, established April 30 last, has been extended to include practically every European country.

Charges from Australia are as follows: Sweden, £2/9/-d a minute, minimum charge £7/7/-d; Norway, £2/10/-d and £7/10/-d respectively; Denmark, £2/9/-d and £7/7/-d; Netherlands; £2/5/-d and £6/15/-d.

Services also have been opened or are planned for France, Germany, Spain, Portugal, Italy, Czechoslovakia, Switzerland, Austria, Hungary and Poland. In Australia services have been extended to Queensland and South Australia.

Cable Faults; How to Detect and Locate

Methods Practicable for Use in Detection and Location of More Common Faults in Exchange Cables with Apparatus Readily Available in Operating Field—Address at the Convention of Wisconsin State Telephone Association

By J. W. Deist,

Engineering Department, Wisconsin Telephone Co., Milwaukee, Wis.

When telephone circuits are placed in cable, a large number of circuits are confined and protected by a single lead sheath, and any rupture of this sheath may result in service reactions to a large number of customers. For this reason it is important that cable faults be located and cleared before serious service reactions develop.

This paper discusses briefly methods which are practicable for use in the detection and location of the more common

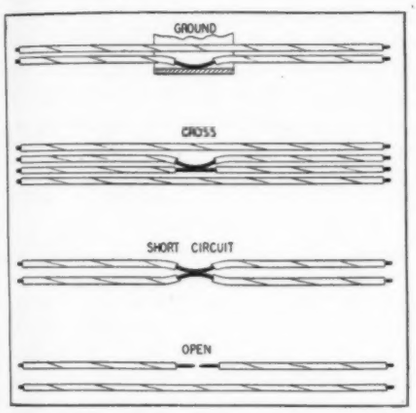


Fig. 1. The More Common Faults Found in Telephone Cables.

faults in exchange cables, using apparatus which is, or can readily be made, available in the operating field.

Detecting Defective Pairs.

The more common faults which are usually found in cables are illustrated in Fig. 1.

A ground occurs when a wire comes into electrical contact with the sheath of the cable. This electrical contact may be due to actual mechanical contact between the wire and the sheath, or it may be due to moisture which has entered the cable in some way and has impaired the insulation to such an extent that its resistance becomes quite low.

A cross results when two or more wires come in contact with each other. A short-circuit is the particular case of a cross between the two wires of the same pair. An open is, of course, a break in a wire. The faults illustrated in Fig. 1 may be found either within the sections of a cable or at splices.

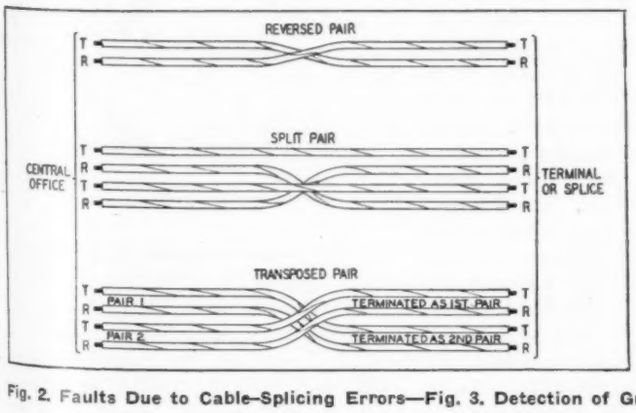
Certain other faults due to mistakes in splicing are shown in Fig. 2.

Continuity Tests.

We shall first discuss the detection of cable faults by the so-called "continuity test" method, which makes use primarily of a telephone receiver or a voltmeter in series with a battery or a testing tone to check the continuity of a circuit for various connections.

Fig. 3-A shows the connection for detecting grounds when using a battery and receiver. When testing with a receiver, one side of the battery is connected to the sheath of the cable (ground) and the other side, in series with the receiver, is connected to the wire suspected to be grounded. A click will be heard in the receiver when the grounded wire is touched with the test point.

Care must be taken to distinguish between a click due to a ground and a click due to the capacity of a non-grounded wire. A capacity click will be heavy, if the cable is long, when the wire is first touched with the test point, but when the wire is tapped several times in quick succession, the capacity click after the first one will be very slight. A ground click will be as heavy on successive tappings as on the first connection. Also a ground click is heard on the make and break of contact, while a capacity click is only on making the contact.



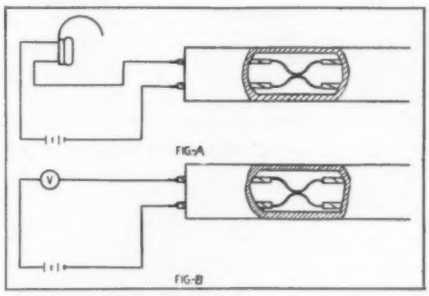


Fig. 4. Methods of Detecting Crosses and Short Circuits With Receiver and Battery and With Voltmeter and Battery.

Grounds due to moisture are generally indicated by a scratching sound in the receiver when connection to the grounded wire is maintained.

Where available, it is desirable to use a voltmeter in series with the battery in place of the receiver when testing for grounds. This is especially true when the ground is due to moisture and is, therefore, not solid. The connections which are used in detecting grounds by means of a battery and voltmeter are shown in Fig. 3-B.

When using a voltmeter, the meter will register the full voltage of the battery applied when the test point is connected to a solidly grounded wire. If the ground is not solid, the meter will read something less than the full voltage of the battery, the reading giving an approximate indication of the resistance of the ground.

Detection of Crosses and Shorts.

The methods just discussed for detecting grounds may also be used to detect crosses and shorts. It is only necessary to substitute one of the wires suspected of being crossed for the ground connection of

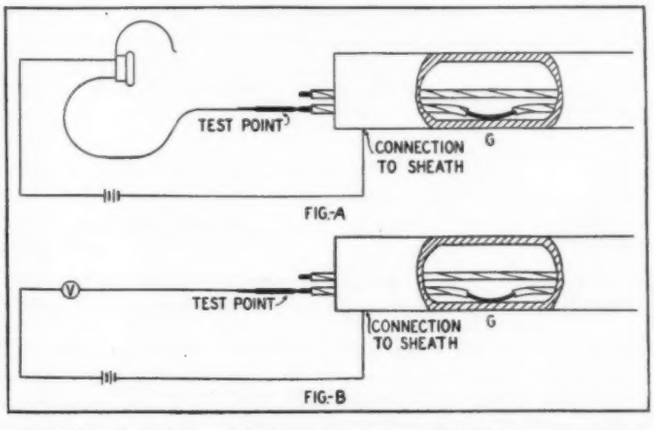
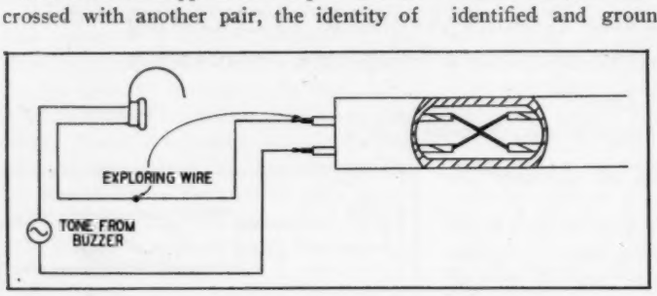


Fig. 2. Faults Due to Cable-Splicing Errors—Fig. 3. Detection of Ground Using Receiver and Battery and Using Voltmeter and Battery.

the battery as shown in Fig. 3. The diagrams for use in detecting crosses and short circuits are shown in Figs. 4-A and 4-B.

It sometimes happens that a pair will be crossed with another pair, the identity of the second pair being unknown. The best way to pick out the second pair is to use a tone and receiver. The connections for making this test are shown in Fig. 5. A diagram showing a circuit using a simple buzzer for producing tone for this test will be shown later.



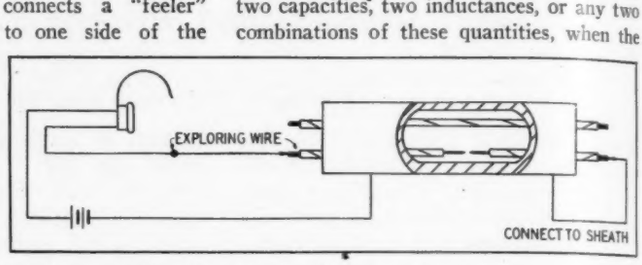


Fig. 5. Detection of Crosses and Short-Circuits by the Tone Method—Fig. 6. Detection of Opens.

One side of the tone circuit is connected to the wire or pair reported to be crossed with another wire or pair. One of the receiver terminals is connected to the other side of the tone circuit and the other receiver terminal to an exploring wire.

Contact is then made between the exploring wire and other wires or pairs in the cable until one is found on which the tone is approximately the same as when the exploring wire is connected to the suspected wire or pair. The wire or pair on which the tone is heard will be the one which is crossed with the original wire or pair. A less intense tone, due to induction, may be heard on other wires or pairs.

Opens are detected by the absence of an electrical circuit. Thus a wire suspected of being open may be grounded at the distant end, and then tested for a ground at the testing end as shown on Fig. 6. Failure to detect the ground will indicate that the wire is open.

Care should be taken here also when using a battery with a receiver for this test, to distinguish between the ground click and a capacity click.

Reversed, Split and Transposed Pairs.

Reversed, split and transposed pairs are best detected by using continuity tests much the same as already described. The connections for these tests are shown in Fig. 7. To make these tests, it is generally best to first establish a talking circuit between the central office and the terminal, or between the two ends of the section to be tested. Usually a good spare pair may be selected for this purpose.

The tester then connects tone from a buzzer between the wire which is to be identified and ground. The other tester connects a "feeler" to one side of the talking circuit and grounds the other side of the talking pair through a condenser. Then, with a test pick connected to the end of the feeler wire, he touches the wires in the terminal one at a time until he gets the tone.

The tone will be heard by both the tester and helper at the same time. The helper then tells the tester the pair number and the side, tip or ring, on which he found the tone. By thus identifying the wires at the two points of termination, it is possible to detect reversed, split and transposed pairs.

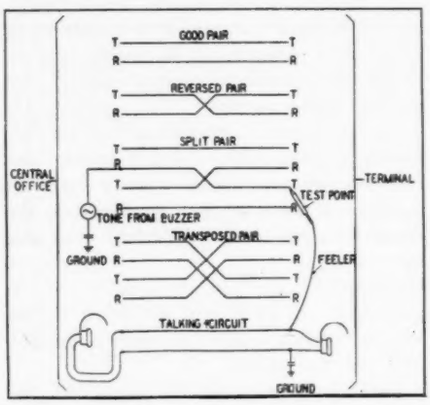


Fig. 7. The Detection of Reversed Split and Transposed Pairs.

Tone Comparison Tests.

The tone comparison test is an accurate and rapid method of detecting grounds, crosses and shorts. Under certain conditions it will also indicate opens and split pairs. It is, therefore, a convenient means for check testing all pairs in a new cable after splicing has been completed.

The test is made with an ordinary head receiver to which two equal non-inductive resistances have been added. Fig. 8 shows the electrical arrangement of this circuit.

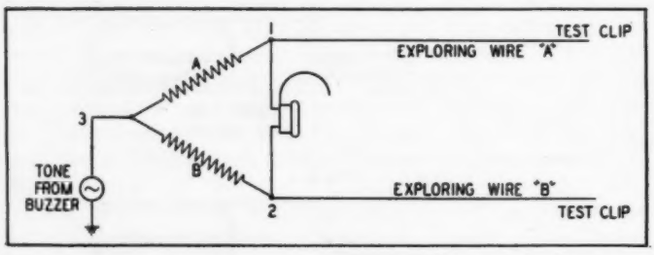


Fig. 8. Electrical Arrangement of the Tone Comparison Test.

It will be noted that the tone comparison circuit corresponds to a part of that of the Wheatstone bridge. The resistances, *A* and *B*, form the ratio arms, and the receiver acts as a detector when the network is unbalanced. With this arrangement an alternating current should be used. By means of tone comparison, it is possible to check the equality of two resistances, two capacities, two inductances, or any two combinations of these quantities, when the circuit is completed as shown in Fig. 9.

In this diagram the third and fourth arms of the Wheatstone network are shown as capacities, since it is generally various types of capacities which are compared by the tone comparison test. It will be noted that if C_1 equals C_3, no current will flow through the receiver, but if C_1 and C_2 are not equal, a tone will be heard in the receiver, the strength of this tone being dependent upon the degree of difference between C_1 and C_2. This is the general principle used in all tone comparison tests.

As applied to testing cable pairs, it is known that each wire in a cable has capacity to all the other wires and to the sheath. This capacity, known as the ground capacity, will be different for wires of different lengths. Two wires electrically connected (crossed) will have a much higher capacity than a single wire. Therefore cable conductors may be substituted for the condensers (capacities) shown in Fig. 9, the sheath of the cable being the point common to the two condensers.

This arrangement is shown in Fig. 10. It will be noted that the capacities C_1 and C_3 in Fig. 10 are the capacities of wire 1 and wire 2 to ground. The capacity C_2, from wire 1 to wire 2, has no effect on the balance since it merely shunts the receiver.

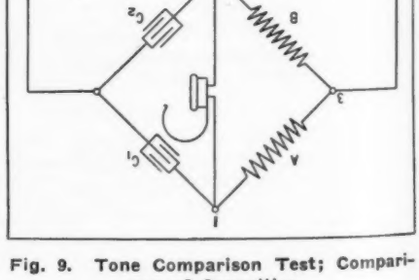


Fig. 9. Tone Comparison Test; Comparison of Capacities.

Fig. 11 shows the connections to be used in making tone comparison tests. The resistances, *A* and *B*, are generally of about 1,000 ohms each and should be comparatively closely balanced. The tone is fur-

nished by any convenient means available.

Fig. 12 shows a suggested connection for supplying tone for any of the tests described in this paper, using any available buzzer and a magneto type telephone induction coil. The condenser shown bridged across the contacts of the buzzer is merely to reduce arcing and may not be necessary in all cases. The condenser in series with the output leads is used to keep direct current from the buzzer battery from getting onto the circuits under test.

Referring to Fig. 11, exploring wire *a* is connected to one side of a pair which, for the purposes of this test, is regarded as a standard conductor. Exploring wire *b* is then connected to the ring side of the same pair. The tone from a buzzer is connected to terminal 3 and ground. If the capacity of the tip side is equal to that of the ring side, no tone will be heard in the receiver.

Exploring wire *b* is then connected to the tip side of pair 2, then to the ring side of pair 2, and so on to include all of the conductors in the group which contains the standard pair. If no tone is heard in the receiver in any of these tests, it may be assumed that the pairs tested are free from crosses, grounds, or shorts. If a tone is heard, it is probable that the wires on which unbalances were noted are defective, or at least are not like the standard wire.

The standard pair should be of the same gauge and must be of the same length as the other pairs which are connected with it. If the lengths are different, the capacities will be different gauges for which reason the standard should be of the same gauge as the other wires.

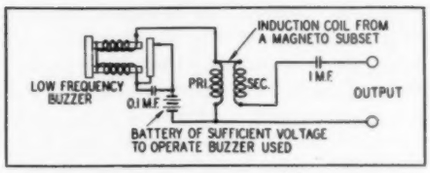


Fig. 12. Connections Used in Making Tone Comparison Tests.

Determining Cause of Unbalances.

The wires on which unbalances were found may be tested further to determine the type of fault existing. This may be done by connecting exploring wire *a* to both sides of a good pair.

The single wires that balance against this pair are either short-circuited or crossed. If both wires of the same pair balance, there is a short-circuit. If only one wire balances, the trouble is a cross.

Split pairs may or may not be indicated in the ordinary tone comparison tests. A positive check can only be obtained by the continuity test method already described. If the split is between pairs in widely-separated groups, a tone may be heard when making the regular tone comparison tests.

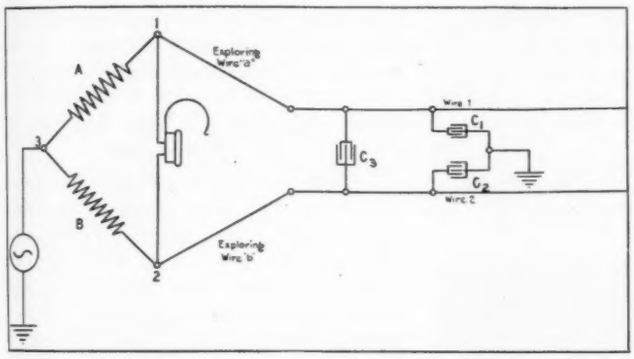


Fig. 10. Tone Comparison Test; Comparison of Capacities of Wires in Cables—

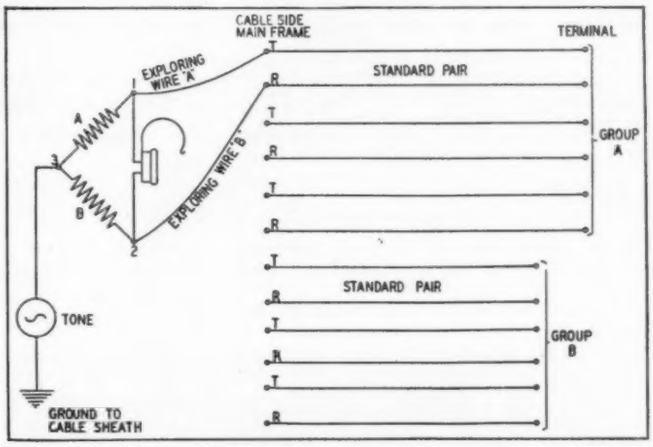


Fig. 11. Tone Comparison Test; Working Diagram.

Location of Cable Faults.

After it has been determined that certain pairs contain a given type of fault, it is, of course, desirable to be able to locate the position of the fault fairly accurately when it is desired to clear it.

Perhaps the easiest method for determining the location of shorts, crosses, grounds and split pairs is by circulating a tone through the fault and passing an exploring coil along the cable sheath.

Figs. 13-A, 13-B and 13-C show the methods of connecting the buzzer tone to locate a short, cross or ground, respectively. For all of these connections, when the exploring coil is passed along the cable sheath anywhere between points *A* and *B*, a tone should be heard in the head receiver which is connected to the exploring coil.

After the exploring coil passes point *B* toward *C*, the tone will no longer be heard, or will be very much weaker, and it will be found that *B* is the point at which the trouble is located. The tone heard by means of the exploring coil will be much weaker in the case of a short circuit, due to the greater neutralizing effects of the two conductors of the same pair.

Fig. 14 shows the method of connecting the buzzer tone for locating two of the common types of split pairs. The elimination of split pairs is, of course, necessary to prevent the crosstalk and noise which generally accompanies this condition on the pairs affected.

In Fig. 14-A, which is the case of a pair being split at a single point, a tone of a certain strength will be heard when the exploring coil is passed over the cable sheath from point *A* to point *B*. After passing point *B* toward point *C*, the tone will be somewhat diminished, indicating that the pairs were split at point *B*.

In Fig. 14-B the split pair has been again transposed so that the pairs are numbered propertly at both ends of the cable but are split for a certain length somewhere between the ends of the cable. In this case, as the exploring coil is passed from point *A* to *B*, a relatively weak tone will be heard, since the two wires are "paired" in this section.

From point *B* to *D* the tone will be increased somewhat since the wires are not paired in this section. The tone will then decrease when the exploring is passed from point *D* toward point *C* since the wires are again paired in this section. Therefore, it is indicated that points *B* and *D* are the points at which the pair is split.

Since the splitting of pairs generally

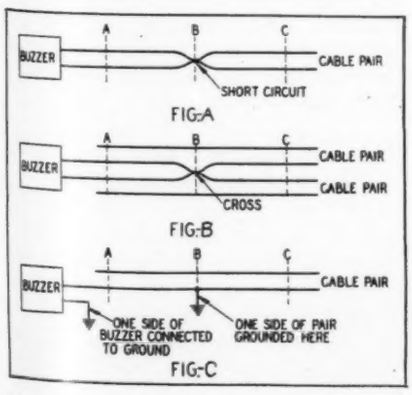


Fig. 13. Tone to Locate Short-Circuit, Cross or Ground, Respectively. Methods of Connecting Buzzer

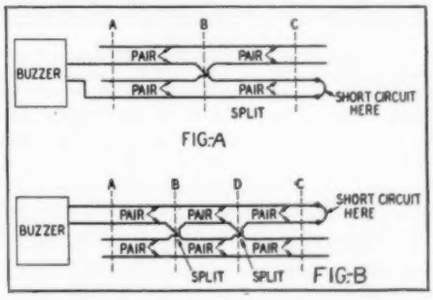


Fig. 14. Method of Connecting Buzzer Tone for Locating Two of the Common Types of Split Pairs.

occurs only at splices, it should not be particularly difficult to locate this trouble in the manner just described, since it is usually necessary to pass the exploring coil only over the splices.

Shorts and crosses may be located by using a Wheatstone bridge connected to the two wires which are shorted or crossed and measuring the resistance of the faulty conductor to the short or cross by the usual Varley or Murray loop methods. Knowing the resistance of the cable conductors, the distance to the fault can be determined.

Grounds also can be located in a similar manner. The methods of applying these tests will not be taken up here since complete directions are usually included with all bridges designed for this purpose.

The location of opens can be made approximately with the aid of a Wheatstone bridge. We shall consider briefly the application of a simple bridge arrangement which can be made up for this purpose. To locate opens in cable pairs with a

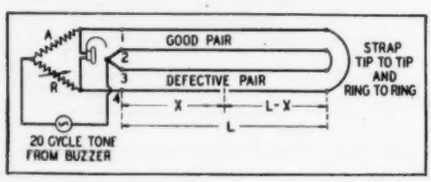


Fig. 15. Simple Murray Loop Arrangement of Wheatstone Bridge for Locating Opens.

Wheatstone bridge, it is necessary to use the so-called Murray loop arrangement. A simple arrangement of this type of bridge is shown in Fig. 15.

As seen from Fig. 15, the same type of bridge is used as was used in the tone comparison test, except that in this case one of the known resistances is varied to indicate the actual degree of unbalance between the cable pairs which are used in the capacity arms, with the connections made as shown in the figure.

The bridge is balanced by adjusting the resistance, R, until no sound is heard in the receiver. Then from the theory of this type of bridge it can be shown that:

$$X = \frac{2LA}{A+R}$$

In this equation X is the distance to the open, in feet; L, the total length of the cable in feet; A, the fixed resistance of the bridge; and R the value of the variable resistance in this branch of the circuit when a balance is obtained.

An approximate idea of the distance from the central office, or from a cable terminal to the location of an "open" in a cable conductor, can frequently be obtained by comparing the volume of the capacity click between the good pair and the pair which is open, with the aid only of a telephone test set connected between the cable sheath or ground and the conductors tested.

In conclusion, we have attempted to show how ordinary cable faults may be detected and located. It is hoped that we have been of some help in stimulating interest in this matter, since the prompt clearing of troubles is important from the service standpoint, particularly since many faults, if not promptly cleared, may later result in serious sheath failures and general impairment of service.

For example, suppose a stray bullet lodges in an aerial cable. This will probably result in one or more conductors becoming shorted, grounded, or crossed at the time. However, if such a defect is not located promptly, the whole cable may later be put out of service, due to water entering through the bullet holes.

If minor cable sheath failures of this nature are located and repaired soon after the failure occurs, complete cable failures may often be avoided.

An effective means of locating these minor troubles consists in testing idle cable conductors from the central office as opportunity permits, using the same methods as have been described.

A NEW LARGE INTERNATIONAL ORGANIZATION.

(*Concluded from page* 41.)

dent of Automatic Electric Inc., of Chicago; W. S. McLucas, chairman of the Commerce Trust Co. of Kansas City; Frank H. Woods, president of Lincoln Telephone & Telegraph Co., Lincoln, Neb. and chairman of the Addressograph Co., and several others.

Officials of the Gary company, emphasized that, except for manufacturing operations at Chicago for export, the activiites of the General Telephone & Electric Corp. would be outside of continental United States.

It was further stated that the present organization, identity and activities of the Associated Telephone & Telegraph Co. and subsidiary and affiliated companies would remain unaffected, excepting that enlarged capitalization would make possible further extension of the operations of the affiliated companies.

Elisha Walker, chairman of the Transamerica Corp., replying to an inquiry concerning his views as to the significance of the formation of the General Telephone & Electric Corp, said:

"It deserves to be noted that, in an era distinguished not infrequently by industrial overproduction, there has been no excess of production by manufacturing plants producing the requirements of telephonic communications systems overseas.

With few exceptions the telephone systems outside North America are greatly underdeveloped and public sentiment in such countries is eager for increased development. They have in mind that extensions of the telephone systems provide an economic impetus to the business of each country. Therefore, the potential demand for telephone extensions and their recognized economic value to the population served, should stimulate manufacturing and alleviate unemployment.

We feel justified in believing that the general trend in the activities of this industry—the manufacture, installation and operation of telephone systems outside the United States—will inevitably be upward.

I am informed that the ratio of population to telephone instruments in the United States is somewhere in the neighborhood of 5 to 1, while outside this country it is nearer 100 to 1. In view of that radical divergence and having in mind the financial backing now provided for the General Telephone & Electric Corp., we may anticipate, I believe, a continuing development in telephonic communications overseas.

Important as this primary result may be to the sponsors of this new corporation, the secondary result—by which I mean the general stimulation of trade and commerce brought about by improved communications—may well be of very real importance to a vastly larger number of people.

If, in undertaking an enterprise that promises a reasonable reward, we may increase the comfort and convenience of distant peoples and at the same time appreciably enlarge our own world trade, we regard the effort as well worth making."

New Telephone Lines Started in the Philippines.

Construction of a long distance telephone line to San Pablo and Santa Cruz, Province of Laguna, and Lucena, Province of Tayabs, which will connect these two rich coconut provinces with Manila, has been started, according to recent reports released by the Philippine Long Distance Telephone Co. The company also has looked into the possibilities of building a line to Cavite as part of its provincial expansion program.

With the recent completion of two additional circuits to Baguio, there are now approximately 700 kilometers of long distance telephone lines in operation, connecting the important trading centers of central and northern Luzon with Manila. Assistant Trade Commissioner Harvey V. Rohrer, Manila, reports. The Negros Telephone Co., a subsidiary of the Philippine Long Distance Telephone Co., is contemplating the establishment of a telephone line to Kabankalan, a distance of about 60 kilometers from Binalbagan, in the heart of the sugar district.

Texas Association Announces 26th Annual Convention for 1931.

The Texas Independent Telephone Association will hold its 26th annual convention in Fort Worth on March 17, 18 and 19, 1931. The convention will take place at the Texas Hotel.

L. S. Gardner, of Waco, Texas, is president of the association. The association urges all members to keep this date in mind and attend the 1931 convention in March.

Here and There in Telephone Work

Business College Offers Training in Answering the Telephone.

Several new and exclusive features have been added to the service offered by a business college in Tacoma, Wash., for the coming year. Chief among the new equipment is a practice telephone exchange which has been installed by the Pacific Telephone & Telegraph Co. This will give this college the distinction of being the only business school in Tacoma that offers students training in this branch of office work.

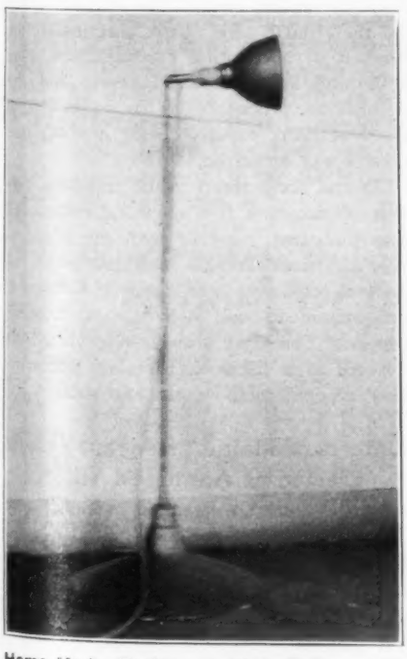
The telephone company will assist in conducting a course under the direction of its traffic experts. This service will give the students a thorough training in the operation of a local switchboard and also instruction in the proper use of the telephone as an important piece of business equipment. According to the president of the college, it is a decided advantage for a student to have this knowledge since most of the larger business offices have their own local exchange, and much of today s business is done over the telephone.

"I Wonder Why" of An Observing Traveling Telephone Engineer.

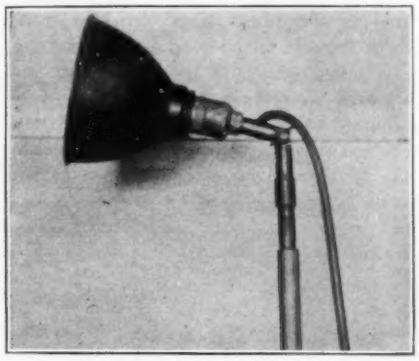
By Ray Blain.

I wonder why some wide-awake manufacturer doesn't come out with a floor-type lamp for use around the telephone exchange?

The usual method of providing light in close places in the equipment is to have an ordinary lamp bulb, with a guard over it, on the end of an extension cord. This arrangement is never satisfactory, for it is most difficult for a two-armed man to hold the light where it is needed and work.



Home-Made Design of Floor-Type Lamp for Use Around Exchange.



A "Close-Up" of the Reflector and Socket-Arrangement.

To overcome this difficulty a hook is generally attached to the guard, and this is used to hang the lamp on cable forms or anything from where it is hangable. This is a dangerous practice, for frequently someone will stumble over the cord and pull the cable out by the roots, a practice never beenficial to telephone service.

Another disadvantage is that the light is generally hanging where the workman must look directly through it. The rough handling on the end of the extension cord also makes the life of the bulb short and the renewal frequent.

We were not satisfied with the extension cord arrangement, so built up one from odds and ends as indicated in the accompanying illustration. This lamp resembles a "Wouf Hong" but is actually a cross between a bridge lamp and a Ford spotlight. Anyway, it does the trick. One can set it up in almost any location and focus the light on the spot where it is desired, and there is no danger of injuring the equipment.

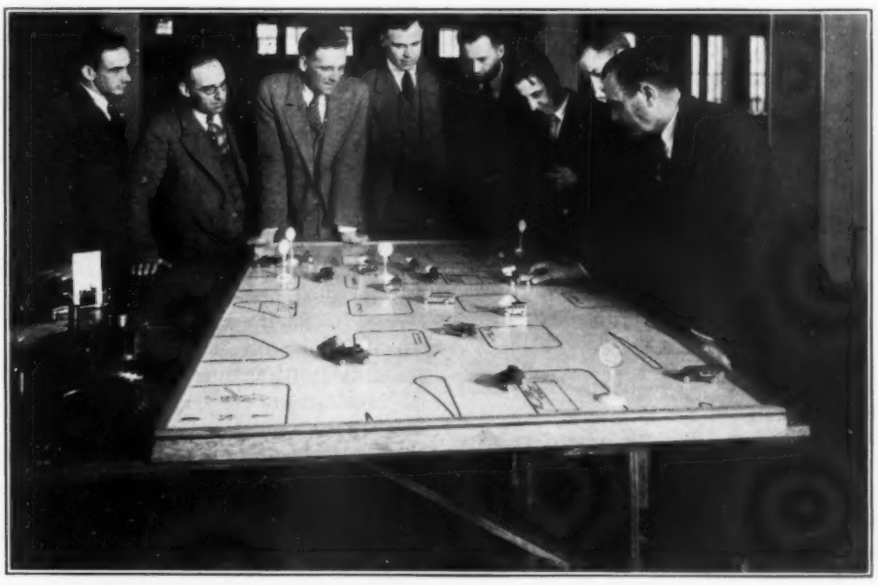
The main bracket or upright is adjustable so that the lamp can be raised or lowered to any height desired. The lamp will also tilt in either direction and can be clamped in the desired position. The only improvement we can suggest is to equip it with a "Roly-Poly" bottom so that it cannot be upset.

Company's Motor Driving School Has Unique Traffic Board.

The driving school operated by the Pacific Telephone & Telegraph Co. in San Francisco, Calif., where company drivers study automobile operation and maintenance and all state, city and company traffic rules, is part of the company's campaign to reduce accidents.

An interesting feature of this school is a unique traffic board, illustrating 24 blocks of city streets, with miniature motor busses, trucks, taxicabs and other cars. It is understood that such a board is employed nowhere else in the country for similar purposes, although a modified form of it is sometimes utilized by courts in accident cases.

To "no accident" drivers the company awards four grades of emblems, for drivers who have gone, respectively, one



Traffic Courts Have Used Apparatus Like This in Accident Cases, But the Pacific Telephone & Telegraph Co. Uses It to Instruct Its Hundreds of Drivers to Drive Safely and Courteously. New Traffic Laws Are Studied with the Aid of This Board, Which Is Marked Out in City Streets; and with Miniature Motor Vehicles the Effect of New Laws Is Graphically Illustrated.

year, two years, three years and "over three years" without accidents. The emblem is attached near the upper left-hand corner of the car radiator. It reads, "Stop Accidents. This Driver Had None. One Year."

The company recently issued a new booklet of driving rules, which is mainly a reprint of rules long in effect. Part of one rule which the company enforced for years is now a state law. This rule warns drivers that "People who have just alighted from street cars are sometimes bewildered and do not know which way to go. Stop your car—give them time to get their bearings before attempting to pass them."

Correspondence Stickers Help Patrons Build Telephone Trade.

The Michigan Bell Telephone Co. is offering its business customers a series of printed stickers, for use on correspondence and invoices, to advertise their telephone numbers and to suggest the purchase of their products or goods by telephone. Retailers and wholesalers find the stickers of considerable advantage in the development of orders from both old customers and prospects.

Stickers That Help the Michigan Bell Company's Business Customers to Sell. They Are Designed to Attach to Correspondence and Invoices, and Urges the Dealer's Clients to Order Both Goods and Service by Telephone, the Time-Saving, Cost-Reducing Way.

Distributors are giving more and more attention to the matter of customer service, and the promotion of telephone contact enters closely into such service. In many instances they offer, on the stickers the telephone company supplies, to pay the long distance charges, particularly if sizable orders or service are involved.

Customers are thus encouraged to place orders or to arrange for adjustments without the necessity of waiting until a salesman makes his regular visit. That means a saving in time and expense, more frequent orders and deliveries, and a better satisfied clientele.

When the customer is convinced that he will receive adequate service merely by telephoning his wants, too, the wholesaler or retailer is sure of continued patronage at a very small cost to him. And the customer is assured of speedy attention to his wants.

A specially-trained personnel often is assigned to the work of receiving the telephone messages and in handling, with accuracy and dispatch, the trade so developed. Some distributors arrange for the salesman to supplement his personal visits by frequent telephone contact with the trade, more business and improved customer relationship almost always resulting.

The character of the stickers is indicated in the illustrations on this page. Three suggest telephoning orders, one suggests telephoning for an appointment, and two urge the telephoning of orders collect.

Many Michigan firms are using the stickers consistently, with increasing satisfaction to themselves and to their trade. Wholesalers use them on both local and out-of-town mail contacts, and retailers use them on a local call stimulation basis.

Among the present users are tire companies, drug companies, electric supply houses, automotive products concerns, wholesale grocers, wholesale dry goods firms, grain wholesalers, fruit wholesalers, investment houses, radio distributors and coal dealers. To one drug concern alone the Michigan Bell company recently provided supplies of the stickers for each of its 19 stores.

New York Hotels Have Toll Terminals for Direct Connection.

Thirty-six New York hotels now have toll terminals connecting the hotel switchboards directly with Long Distance, according to the New York Telephone Co. The long distance operator, rather than the hotel P. B. X. attendant, now assumes the responsibility for taking the details of a call from a guest and of giving any reports of the call directly to him.

Another desirable feature of the service is that the long distance operator voluntarily quotes the charges on the call to the hotel attendant and furnishes any other details necessary for billing purposes.

Accounting Course Given Pacific Bell Supervisory Employes.

Today's executive thinks and talks in terms of "balance sheets," "net income," "ratio of assets to liabilities," and similar expressions which, a few years ago, were considered the exclusive property of the accountant. He depends upon reports prepared by the accountant to inform him of the financial condition of the business; he has trained himself to analyze these reports, and is thus equipped to make his plans for the future conduct of the business.

Realizing the value which should accrue as the result of a greater understanding of accounting, the accounting department of the Pacific Telephone & Telegraph Co. at Los Angeles, Calif., recently presented a special course to a class of 33 supervisors of the operating departments, the course covering a period of seven weekly meetings.

In order to give the class some background of accounting theory, the first two sessions were devoted to a discussion of the fundamentals of accounting, including the purpose of accounting, double entry, assets, liabilities and proprietorship, the account, journal and ledger, the balance sheet, the statement of profit and loss, accruals and prepayments, and depreciation.

The third meeting was held in the revenue accounting offices, and after a discussion of revenue accounting work the class was taken on a tour of the offices, and the various types of equipment were demonstrated.

Disbursement accounting was taken up at the fourth and fifth meetings; the method of accounting for vouchers, payrolls, and material was covered, and the accounting procedure in connection with the overhead expense and clearing accounts was explained.

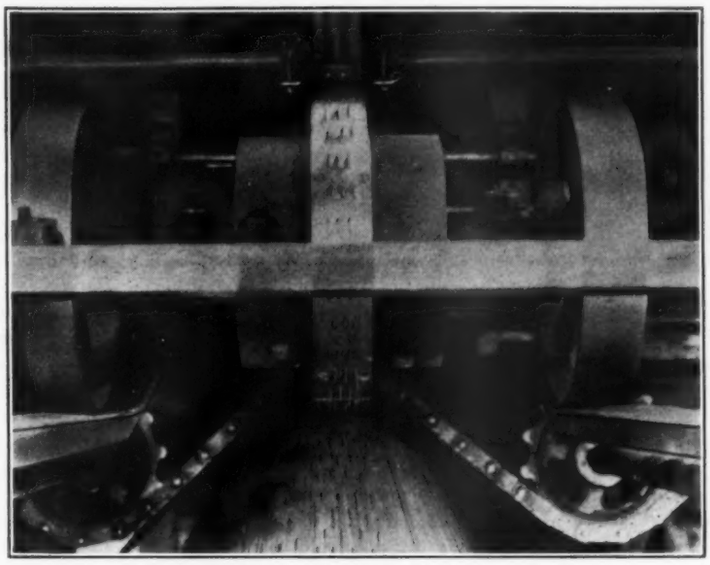
At the sixth meeting the standard system of accounts for telephone companies was discussed, together with the preparation of journal entries, maintenance of the general books and preparation of the financial statements and departmental expense reports. The seventh and last meeting was devoted to a discussion of plant performance reports, methods and statistics.

Officers of Maine Telephone Assoc. Elected at Annual Meeting.

At the annual convention of the Maine Telephone Association, held in Portland last month, officers were elected as follows:

W. J. Thompson, South China, president; H. E. Foster, Winthrop, vice-president; and A. Van Den Kerkhoven, secretary-treasurer, Bethel.

Preserving Pole Strength Where Needed Most!



Bell's New-Method Incising Machines

utilized exclusively by this company in the preparation of poles creosote butt-treated to the stringent specifications of

Bell's Pentrate Process Preservative Treatment

are the product of expert engineering skill, exhaustive research and the application of facts as determined by scientific study. This improved method of puncturing the sapwood in order to permit the free flow of creosote oil into the pole at the ground-line, is pronounced by engineers a very decided improvement over the old method machines that hammer in the knives or teeth. Bell's New-Method Incising Machines leave no sliverings, abrasions or loosened sapwood — preserving the original pole strength by SPREADING the fibres—instead of cutting or breaking them down crosswise.

We Creosote Butt Treat to Any Desired Specification — Thousands of Poles Ready for Immediate Shipment — 12-Hour Shipping Service on Rush Orders — Let Us Ship You That Next Carload.

Bell Lumber & Pole Company

Minneapolis - Minnesota

High Altitude Western Red and Northern White Cedar Poles

"Bell Ships Guaranteed Grade Poles Quicker!"

When writing to the Bell Lumber & Pole Co., please mention TELEPHONY.

Modern Youth's Opportunity in Plant

Leadership Has Two Major Functions; To Inspire the Will to Act and to Direct Action, Give It Aim and Guidance—Characteristic Feature of Leader in Managing Telephone Plant Is Ability to Comprehend Complex Relations

By John A. Bracken,
Instructor, Michigan Bell Telephone Co., Grand Rapids, Mich.

Today, youth is the world's greatest going concern. Never before in history has youth been so prominently before the eyes of the big business. Never before has youth occupied such positions of responsibility and influence.

We hear of youth and his actions discussed everywhere. Much is said about the young blood and pep of youth; statements that may represent almost anything from industrious mediocrity to genius. In themselves, these statements have as much value as any other like phrases, but which do not necessarily guarantee that youth alone is the only essential to fit a young man for the responsibility of leadership. Superior knowledge and moral qualities, more rightly determine fitness for leadership. Physical stature and age are assets, but not essentials.

The characteristic feature of a leader in managing a modern telephone plant is the ability to comprehend complex relations, to correlate without friction and without waste, factors of plant construction, operation, and maintenance; to make of the organization a smoothly-working machine that will provide the most efficient communication service to the public —a mighty big job for the inexperienced youth to measure up to.

In view of the complexity of the modern telephone plant, and the fact that the young man of today is entering upon the performance of so specialized work as leadership and management, his opportunity for acquiring breadth of view by "experience" as compared with that of his predecessor is limited. He is confronted by many problems to solve if the telephone company would prosper at a profit.

Some of these problems have to do with the requisitioning and distribution of materials and supplies, seeing that construction, operation, and maintenance work is efficiently performed, and that safe practices are followed, the elimination of waste, also the urgency of reducing overhead losses. All of these are principal problems that cannot be successfully accomplished without teamwork and loyal cooperation of every group member.

Prestige.

Since a leader's word must carry weight with his subordinates before they will be willing to support him, perhaps the main requisite that the young man is most in need of as a leader of others is prestige —that moral influence due to past reputation and achievements.

Successful leaders gain prestige even in rendering adverse decisions. Subordinates respect their leader who, under appropriate circumstances, does not hesitate to tell them just what they can do and cannot do.

Loyalty is most essentially prestige. It must be developed not only as to the young leader, but as to the entire organization; and it is best taught by example. The leader who at every opportunity shows his loyalty to the organization of which he is a member, will soon find subordinates becoming more and more loyal to him.

Any adverse criticism of higher authority will result in spoiling the morale of the young leader's own group. A leader who voices criticisms of higher authority in the presence of subordinates, tends to destroy loyalty to himself.

Human Management.

No one ever really learned from books how to manage others. Whatever is done must be in accord with human nature.

The young leader should begin by establishing the policy of an open door for all members of his group, and accept suggestions where possible and give due credit. If a suggestion is not accepted, the person offering it should be informed of the reason.

It goes without saying that fair and just dealings with subordinates helps to build up prestige. Unfairness can usually be avoided if time is taken to consider each case on its own merits, and both sides given a hearing.

Popularity of Leader.

The popularity among his subordinates is of considerable importance to the young leader and is greatly due to his personality —that something which no one has quite defined. Popularity, which is so much of a necessity to the leader, is not won by easy-going methods, lack of discipline, overlooking faults or neglect on the part of subordinates.

Criticism of workmanship is necessary, but also should be intelligent. Discovery of a fault should be instantly followed by a remedy. Encourage the criticized to improve, for encouragement is generally productive of better results.

True leadership popularity is founded on admiration of real ability, confidence in fairness and justice, courage and strength of character. It is gained by holding one to a strict performance of assigned tasks, by recognition of good work as well as poor work, and by showing a similar personal interest in all. Without friendly cooperation of his leader, no one can do his best.

By careful study of each individual in a group, it may be found that some are not physically or temperamentally adapted to performing the particular function required in that job, and that they are adapted to performing functions in some other branch of telephone work. Each individual should be placed where he can do his best. A good decision in this respect will lead to the development of both the individual and the group. Furthermore, the necessity for a decision is an opportunity to strengthen prestige.

Mistaken Aggressiveness.

One of the greatest mistakes a young leader can make is that of confounding rudeness with genuine aggressiveness. Being brusque, unpleasant, and snobbish is not showing aggressiveness. Unfortunotely, the general idea of aggressiveness is sometimes distorted. It seems to be founded on the notion of attack on the other fellow's personality. It is wrong in its inception. Personality cannot be changed by attacks of rudeness. It remains fundamentally the same. Moreover, rudeness is fatal to leadership, good fellowship and business.

Tact is very essential to the young leader, but should not furnish an excuse for insincerity and lack of frankness in directing group activities. It is up to the leader to make good rather than make excuses; his word should be his bond.

Successful Leadership.

Perhaps no one is so fortunate as to possess all the qualities, abilities and attributes that characterize leadership, nor does any one person possess even a few to the same degree; but they can, however, cultivate those which they already possess and strive to acquire others. One of these attributes should not be developed to the total disregard of all others, for no one principle of life can be applied in disregard of all others; likewise no single attribute makes for success in leadership.

An observation of men who have achieved success as leaders, reveals that they have attained a quiet, courteous and firm demeanor. They respect the personality of other people as a rule.

Apparently, there is a certain dignity which followers expect to find in their leader. It is not stiffness nor haughtiness, and certainly not artificiality. It is that dignity which comes from earnestness, sincerity, and naturalness.

RANCE SERVICE
TO YOUR SPECIAL
TS LESS THAN
ND OF INSURANCE

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IMPORTANT MEMO

Be sure to see Lynton T. Block & Co.'s Representative at Booth 42 National Telephone Convention

When writing to Lynton T. Block & Co., please mention TELEPHONY.

Color; Its Use in the Telephone Field

Phases of Color in Telephone Field—Use as Medium of Good Will and Sales Appeal—Use Within Properties to Increase Efficiency of Employes—Address Before the Annual Convention of Wisconsin State Telephone Association

By Fergus A. O'Connor,

Manager, Promotion Department, Pittsburgh Plate Glass Co., Milwaukee, Wis.

We feel that color is divided in your field into two divisions. The first is its use on equipment and properties, in which field it is used as a medium of goodwill and sales appeal with your customers, as well as a preservative on your property. The second phase is within your property to increase the efficiency of your employes.

Relative to the first phase, you are in the same position in which the electric light people were several years ago when they found metropolitan areas completely equipped for lighting in every home in the district.

They brought in the feature of bridge and floor lamps which required base plugs. This required lamps and accessories to harmonize with their furnishings. It meant the increased use of light; it meant the addition of curling irons, electric pads, and accessories of that sort to their line of merchandise. That this has been a successful and most profitable field is attested to by the departments that have been developed since that time.

The telephone today is accepted as an instrument of necessity. Were you to look upon your home, your office, or your factory within itself with no communication with the outside world, you could portray the lost feeling which would be evident without the telephone.

We put doors in our homes so that we may have access to the outside. We put telephones in our homes for the same reason, but few builders and engineers have given thought to the possibility of a telephone in each room, and fitting the telephone in as a part of the furnishings through the proper use of color on the instrument, bringing it out as an attractive as well as useful instrument.

Your wife would have her bedroom finished in the lighter feminine tints of ivory, pinks and greens; would spend your money for bedspreads, pillow cases and chair coverings of the lighter colors. And yet you would ask her to put a strikingly opposite color to her scheme, in her room, and pay you for the privilege of having it there. It would become an eyesore in a portion of the house that is devoted to rest; and instead of being regarded as a convenience, might be considered an annoyance.

Extra charges should be made for this type of service, the same as charges today are additional for the hand-set type of telephone. There is no complaint, except that you cannot fill the requests for them quickly enough.

There is a cycle of development in every business. We have in the country and rural communities many homes that are lighted by coal oil and from small power plants. When they hook up with the public utilities sources of supply, they then become prospects for the different stages of development that have been used successfully in the metropolitan areas. First, they want the light; its convenience is evident. Then they wish for electric irons, washing machines, and all the electrical conveniences that are possible for them to obtain. This means additional equipment.

So, too, in the telephone field, the possibilities of development for a profitable revenue are unlimited. The proper use of color to harmonize is easily obtained. The exact shade does not have to be utilized, but rather a neutral tone of green would be satisfactory for almost any home in which green is used. And so it is with the other colors—by the mere toning of seven or eight colors into the pastel tints or into grayed values, so that they are not too attention-taking in a home, but rather restful. This classifies them as a necessary part of the room in which they are.

Color comes down again to a field in which you are directly interested—your offices, your exchanges and your properties. More can be accomplished with less effort, practically no fatigue, and at a greater efficiency, if the proper blending of colors is obtained in exchanges, office buildings, and your properties. Increased valuation is the result of this treatment because of the modernization through this method. It means increased bonding power on your properties. It means a favorable public reaction which is so essential to public utilities today.

In order to make use of color with any degree of success, it is necessary to have a background of knowledge of the fundamentals of color theory; that is, the properties of color, its emotional effects, the proper combining of colors and color terminology.

There are three definite properties of color: Hue, value and chroma. Hue distinguishes one color from another; whether it is blue or red, or green, etc. Value is that property which distinguishes between any normal color and its tints and shades. The tints are lighter than the normal color and the shades are darker. The third property of color, chroma, refers to the gradation from a pure color through its various degrees of diminishing intensity to pure gray.

There are three primary colors—red, yellow and blue—from which all other colors can be made by intermixing or by mixing with white or black. Equal quantities of the two primary colors make a secondary color; that is, red and yellow make orange; red and blue make violet; blue and yellow make green. By varying the amounts of the two primaries used, an almost unlimited number of intermediate colors can be secured, such as yellow-greens, blue-violets, red-oranges, etc.

The colorist has many ways of forming color schemes. The simplest and perhaps the most widely used is the monochromatic color scheme. This is the use of one color with its various tints and shades and in varying degrees of intensity.

An automobile might be painted a dark shade of grayed green with a medium light tint of grayed green for mouldings and fenders and a clear strong green for window reveals and striping. Or, if a woman were to select blue as the color note of an ensemble, the colors used might range from a dark shade of blue through several intermediate tints and shades to accents of blue of fairly high intensity.

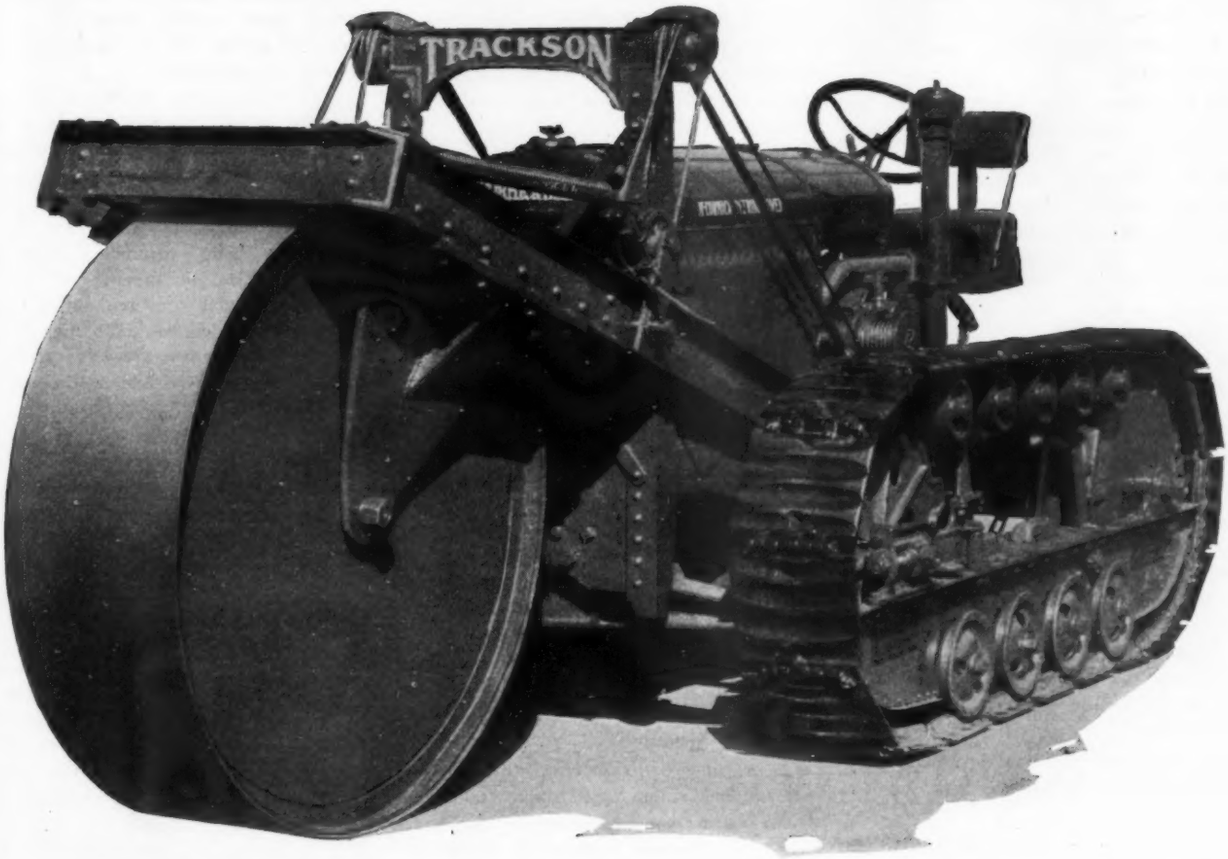
The complementary color scheme is so called because it makes use of all three primary colors. Thus if blue were selected as one color to be used, its complement would be orange, which contains both red and yellow, thus completing the color cycle of red, yellow and blue. In this case the larger areas would be probably blue—not in its full intensity, but grayed down to a soft, pleasing color. Smaller areas of fairly intense orange might be used in this case.

Our knowledge of complementary colors is of further assistance in graying colors

The Telephone Industry in the United States.

In no other country in the world did the telephone industry pass through the evolutionary stages similar to those which it passed in the United States. Hence in no other country does this industry mean what it means here, nor does it influence the progress of the country's civilization as much as it does here.—Dr. M. I. Pupin.

No more hand tamping



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or reducing their intensity. Since we know that the mixture of all three primary colors produces neutral gray, it follows that any color may be made to approach gray by adding its complement. In the case of the blue just mentioned, to reduce its intensity we would add a small amount of the two remaining primaries, red and yellow, or orange.

An analogous color scheme makes use of a series of colors which are harmonized by containing one color in common. For example: Yellow-green, green and blue-green all contain yellow, which serves to relate them and make them harmonize with one another. Nearly any combination of colors may be used together if these are light tints, or pastel colors. Likewise, several intense colors may be used together if they are harmonized by the use of areas of black.

The mere fact that an individual knows the names of various color schemes and the colors that may be used in each, does not necessarily mean that he can use color successfully. The additional knowledge necessary might be summed up as the principle of fitness to purpose. A color may be pleasing in itself but if it is not suited to the use to which it is to be put, its effect is lost. Some colors might be used in the decoration of one room with good effect, but be entirely unsuitable in another room.

The colors used on heavy duty machinery would not be appropriate for kitchen equipment.

The psychology of color determines to a great extent the way we use color. Each color has a definite emotional effect and these effects determine quitely largely the colors we select for any definite purpose.

Yellow is the color which most closely resembles sunlight, so we think of it as a sunny, cheerful color. It is used to bring sunlight and cheer into places otherwise lacking in those qualities.

Red is vital, strong and attention-compelling. Unless used with judgment and restraint, it is conspicuous and irritating.

Blue is cold, quiet and reserved and is used where an effect of dignity and restraint is desired.

Orange, being made of red and yellow, has in general the properties of each, though being neither as light as yellow or as aggressive as red.

Green again reflects the qualities of its two component parts—blue and yellow. It is lighter and more cheerful than blue and has more dignity and repose than yellow.

Violet again partakes of the nature of both blue and red. By varying the quantities of the two colors, we may have a warm red-violet or a relatively cool blue-violet.

The choice of color can influence the apparent size or proportion of the surface being painted. Rooms seem larger and more spacious in light than dark. The apparent length of automobiles is increased by the use of long, horizontal mouldings or stripes or mouldings which call attention to the length.

As a concrete example of the selection of suitable colors, we might take the switchboard room in a telephone exchange. The switchboards themselves being the most important feature of the room might determine its decorative scheme.

Since the eyes of the operator are directed toward the switchboard for long periods at a time, it would be reasonable to assume that it should be finished in as soothing and restful color as possible. A soft, grayed shade of green would be much more suitable than the irritating glare of golden oak or the depressing red-brown of mahogany.

The walls, being merely a background for the furnishings and for the occupants themselves, should be as unobtrusive as possible. If it should be a north room, or one in which there is a minimum of light, the walls might make up for the deficiency by being painted a light, sunny tint of yellow or cream. If the room faces south and does not suffer for lack of sunlight, a cooler color may be used; light tints of yellow-green, green or blue-green, gray or even one of the light tans or ivory.

The floor, being the base of the room, will furnish the darkest color note; and the ceiling, to secure an effect of spaciousness and airiness, will be the lightest. The woodwork, whether it be finished in a natural wood effect, or in a color to harmonize with the walls and switchboard, should have a flat finish so that there will be no glare to irritate the eyes.

While it is necessary for everyone to have some knowledge of color theory and the proper use of color, it is possible to secure advice on the subject from almost any manufacturer of paints, rugs, linoleum, furniture, etc. Each of these manufacturers maintains a staff of colorists and stylists whose duty it is to furnish information concerning the proper use of the various products of their manufacture.

Handling Work of Connecting Companies

Reception Accorded Proposed Introduction of New Ideas and Practices in Smaller Offices—Chief Operators Should Consult With Manager Concerning Various Problems—Paper Presented at the Annual New York Convention

By Miss Nina R. Allen,

Division Traffic Agent, Eastern Division, New York Telephone Co., Albany, N. Y.,

The connecting companies are indeed to be congratulated upon the high type of girls which they have in their employ and for the intelligent and conscientious effort which each contributes to the service. The purpose of my visits to the connecting companies is, as you know, to provide a means of interchanging ideas and practices between those companies and the New York Telephone Co. This will, of course, assist all of us in progressing toward perfection in operating and service.

During the past year our company made arrangements to have a commercial representative in each of our small offices. I understand this idea was acquired from connecting company territory. The functions of this office are confined to the handling of transactions with customers in person at the office. They consist principally of taking applications and orders, and receiving and reporting payments. We find that it helps us to personalize our service and it also increases the facilities for face-to-face contacts.

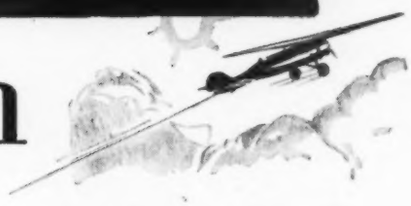
Prior to the introduction of "commercial representation" in our smaller offices, in the majority of cases arrangenemts had been made with a local bank or with a business firm to receive and report payments of telephone bills.

In the eastern division of the upstate area of the New York Telephone Co. particularly, and probably likewise in the central and western divisions, the non-hangup service has been generally adopted but not always without difficulty.

In one instance, every effort and argument on my part for the adoption of the CLR method of handling both short haul and long distance traffic met with refusal. As a last resort I urged that it be tried for a month, promising that I would keep in close touch with both the connecting company office and the toll center. It is gratifying to report that the month's trial was convincing and the non-hangup service is now firmly established there.

This seems an opportune time to refer to the CLR bulletins which our company has forwarded to all toll centers handling

Out of the storm



—*by telephone*

WITH his Western Electric radio telephone the pilot talks with the airport and receives directions for avoiding the storm.

He also hears Government weather reports and directional radio beacon signals which guide him through darkness, clouds or fog.

This equipment, keeping plane and ground in constant touch, marks a great step ahead in flying. It helps to put the new mode of travel on a dependable, efficient basis—doing for air transportation what telegraph, telephone and wireless have done for railroads and steamship lines.

The airplane telephone is backed by more than 50 years' experience with problems of voice transmission.

It was designed by Bell Telephone Laboratories and tested under actual flying conditions in their own planes. It is made with the same care and skill as all the Western Electric apparatus used by the Bell System.

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at least 250 toll calls daily. The information for this bulletin was obtained from the 20-day point-to-point record which we asked you to keep during June of last year.

Another gratifying result of my visits was the introduction of the accurate timing of toll calls. In many offices it had become a habit to permit a subscriber to hold the line indefinitely, particularly on short-haul traffic, charging only the initial rate. In many cases, person-to-person calls were established and charged for at the station-to-station rate.

It is safe to assume that every office, regardless of its size, has received the necessary operating practice books. In many cases the receipts have not been returned and frequently we find that the new instructions are not properly filed, nor made use of. In one recent instance I found that a local operating practice, mailed during the holidays, was still in the family library. Please make better use of these instructions, review the conditions and phrases, even from the first greeting, "Number, please?" upon answering local calls, and the name of your office upon answering toll circuits, and so on to the end of the book.

Toll supervisors' training classes are held throughout our territory every year, usually in the spring. Several managers have arranged to have their supervisory people attend these classes. This training course gives the supervisor a keener sense of responsibility. It broadens her viewpoint inasmuch as it gives her the benefit of the experiences of the entire upstate area.

She is trained in the handling of calls whenever situations arise which require more knowledge, skill and judgment than the operators can be expected to possess. It also familiarizes her with the setup of the toll operating practice so that she is able to find quickly the rule that applies to any given case. It also teaches her the improved method of training and coaching her forces and in addition her people have more confidence in her judgment.

It is contemplated later to hold classes for peg count and force adjustment work, and we hope to receive the same cooperation from the managers.

We have been successful in introducing peg counts, both local and toll, in many of the offices. One manager asked if I thought the average chief operator in a small office was capable of keeping this record. When I replied in the affirmative, he said: "And what do we get out of this?" I explained the specific purposes of this record, pointing out its future value for engineering purposes in checking the capacity of the equipment installed and to indicate the necessity of additional equipment. He concurred in its value, and his chief operator did a fine job.

Simultaneously with the introduction of peg counts, some of the offices agreed to keep a "record of toll service results at non-observed toll centers." This is very valuable information for a toll office, particularly the per cent of calls handled CLR and the speed of service on non-CLR calls, in addition to the per cent of calls not handled CLR due to no circuit conditions, tickets requiring directory work, or waiting signals.

Record of toll calls, toll board methods, is also kept in several of the connecting company toll centers and is of great value to a chief operator. This record shows the daily total toll tickets in addition to a cumulative monthly report of calls, messages and percentage of calls completed.

Don't Repeat Mistakes.

"If this is the first time you have made that mistake, I shall overlook it, for it is not discreditable to make a mistake—once. But when you repeat a mistake, it ceases to be a mistake, and is simply a bonehead play."—Anonymous.

It has been found that several companies are not placing number plates on the subscribers' telephones. If this were done it would perhaps eliminate many of the errors made in recording the wrong calling number on toll calls.

In an office with a two-position board and a total of six operators, I found only two operating sets. It is felt that each operator should have her own set, and there should be available additional sets for emergency use.

In another office with about 950 stations the manager was requiring the operator to accept calls by name; in addition the switchboard was not marked to indicate the different lines, such as party, individual, etc., nor were the classes of service differentiated, the operator being required to memorize coin-box lines.

In this same office they had a list of about 40 numbers which were denied toll service, completely or in part. By this, I mean that only certain subscribers were permitted toll service, and the operator was held responsible for this supervision. These irregularities were corrected when called to the manager's attention.

Standard ringing codes on rural lines replacing the old Morse code were accepted by another manager and arrangements made to have a bulletin forwarded with each directory, calling the subscribers' attention to the change and advising them that this code had been adopted to conform with the method which is generally used throughout the state of New York. Many favorable comments on the simplified ringing were received by this company from its subscribers.

An initial supply of red and white sleeves was left in several connecting company offices. These sleeves are placed on the ringing key to remind the operator that the connection is one requiring special supervision.

An initial supply of fiber caps to be used on out-of-order cords pending their repair was also left in offices unfamiliar with this practice. These caps, when placed on the out-of-order cords, will avoid the necessity of turning the tip of the plug into the socket of the pair, for this has a tendency to break the small wires beneath the cord, causing more serious trouble and expense.

In a few cases the initial supply of fiber caps was not sufficient to care for the number of cords turned down. This is a great handicap to an operator who is making every effort to render satisfactory service, and should be given closer attention by the person responsible for clearing trouble.

The binders and contents of many books on file in offices visited were found to be badly worn and soiled and were replaced by new material. Do a little office housecleaning from time to time, eliminate old rate data, old directories and superseded instructions. Have pride in your surroundings.

I wonder if any of the managers have ever tried sitting on the chairs which they provide for their operators. I have tried a few and found them mighty uncomfortable.

Our plant representative recently stated that the percentage of poor transmission reports received from connecting company offices is very small compared with the number received from New York company offices.

One company with which we recently dealt was under the impression that poor transmission reports were written only when it was necessary to repeat the message. In addition to this item, poor transmission tickets are also written to cover the following conditions: Unable to establish conversation, call canceled, adjustment of time, and subscriber complained to operator.

It is important to write a poor transmission ticket before the circuit is cleared in order to secure the number of the circuit, the position number, the number of the trunk, cord, etc. The writing of poor transmission tickets is a very important item and should receive your careful attention.

It is to be expected that many managers are guided by the experience and advice of their chief operators or the person in charge, particularly on the traffic side of the work. Therefore, it is your responsibility to consult the manager on problems that confront you and to offer suggestions on matters which will tend to improve the service, also on matters which will add to the comfort of your operating people.

In other words, "Make more of your job." This implies a realization of its importance and a readiness to reach out for those things which make the job effective.

from

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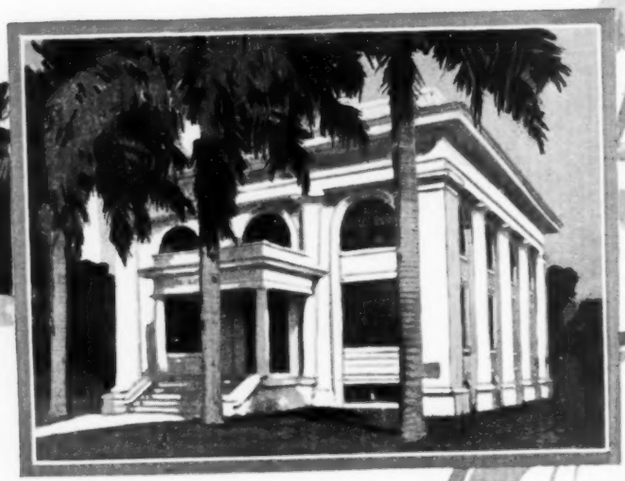

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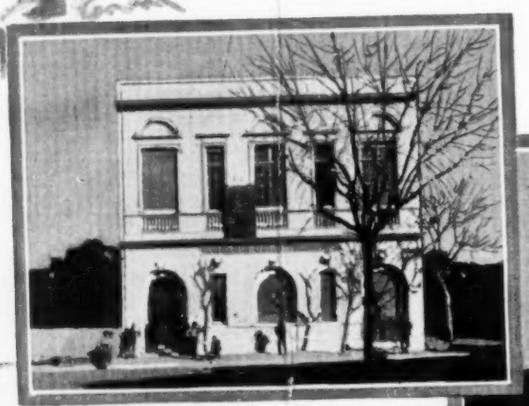

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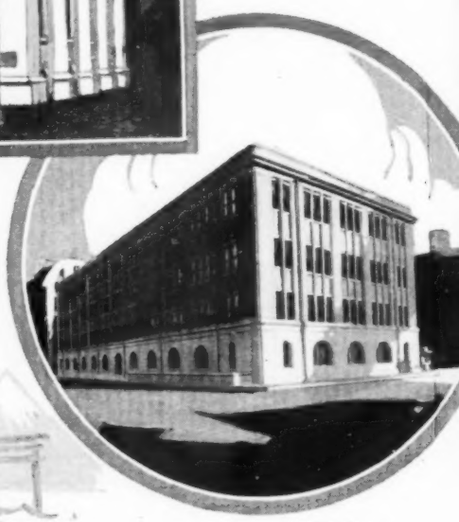

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To the Independent telephone companies of the United States, this world-wide turning to the Strowger principle is of more than passing interest. It shows that their own adoption of Strowger equipment—a process approaching ever closer to standardization—is not merely of local concern, but part of a great world-wide movement—a movement as irresistible in its own field as the growth of the telephone itself has been in the realm of communication.

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Missouri Company's $250,000 Exchange

Southeast Missouri Telephone Co. Established in New Headquarters and Exchange Building in Cape Girardeau, Mo.—Development of Company Organized in 1904 to Serve Cape Girardeau and Now Operates in 35 Other Communities

By E. R. Sears,

Sales Representative, Kellogg Switchboard & Supply Co.

On Independence Day last July, the Southeast Missouri Telephone Co., Cape Girardeau, Mo., celebrated the passing of a milestone which its friends and patrons will remember for some years to come. Midnight of July 3 marked the completion of the largest construction project in its colorful history when it officially opened its beautiful new building and placed in service the new full feature switchboard which it houses.

Thirty-two years ago four public-spirited men in a little river town in Missouri organized a telephone exchange, and called it the Cape Girardeau Bell Telephone Co. These pioneers, M. A. Dennison, A. R. Ponder, L. J. Albert and J. F. Brooks, set up their switchboard in the second story of the bank building and began serving their neighbors.

By 1904 their business had grown to 480 subscribers, and the infant industry was having visions of expansion. The Mississippi River with its tributaries was the principal transportation route for the awakening Middle West, and Cape Girardeau was an important town. Farther up the river was St. Genevieve, also a good river port, whose citizens had the same interests as those of "the Cape." A closer relationship between the two towns seemed advisable, and a merger was consummated by the Cape Girardeau company serving and supplying toll connection to both communities.

At this time Messrs. Dennison and Ponder relinquished their places on the stockholders' register, and the names of Henry L. Rozier, John Tlapek and L. H. Parker appeared. Mr. Rozier was the first president of the new organization and served

View of the Main Entrance of the Southeast Missouri Telephone Co.'s Headquarters at Cape Girardeau, Mo.

until succeeded in 1927 by Mr. Tlapek, the first vice-president and the executive head of the company today.

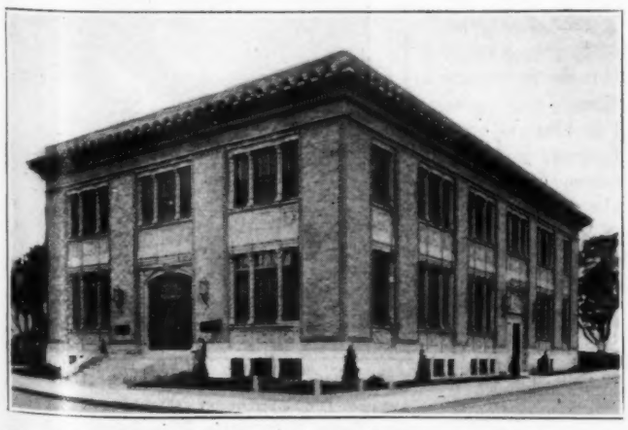
Under this management, the company grew and prospered. New exchanges were built or purchased, and the public was well served. One of the most valuable assets acquired during this period was a young railroad clerk, Charles W. Boutin, who took a clerical position in 1906 under Mr. Ponder, then secretary. In 1913 Mr. Boutin was officially listed as secretary, and a short time later the duties of treasurer were placed on his shoulders. Being successful with these responsibilities, he became general manager in 1927.

In 1929 negotiations were completed with the Southwestern Bell Telephone Co. whereby that company turned over its property in 23 towns to the Cape Girardeau company, which reorganized under the name of the Southeast Missouri Telephone Co. Mr. Tlapek is president of the present organization, and Mr. Boutin's ability is recognized by his election to the offices of vice-president, treasurer and general manager.

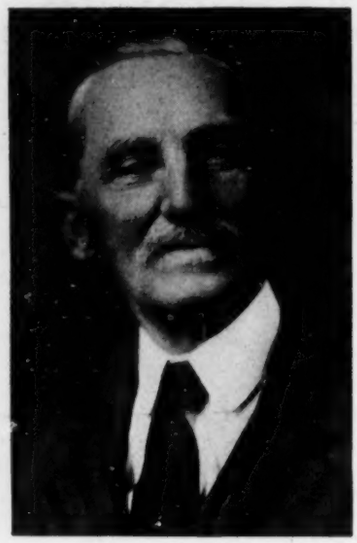
Throughout these years of careful and farsighted management, a telephone empire has been built with Cape Girardeau as its capital. A $3,000,000 organization, serving 20,000 stations in 35 closely surrounding towns, is the reward for its labors. A toll system connects these exchanges with 2,300 miles of line, and 275 employes transact the company's business.

While the company has been growing, the territory has changed materially from the sparsely-settled country that it was in 1898. By 1928 Cape Girardeau was an industrial center of 15,000 people and had outgrown its telephone system. With usual foresight and thoroughness, the telephone company began to study the requirements in its principal exchange. The thoroughness of this work and the ability of those in charge is best testified by the magnificent structure which has just been put in service. The new Cape Girardeau exchange is a dream come true.

The building stands upon a foundation of square-cut Bedford stone which is enhanced by well-kept lawns on all sides. Above the first floor line the walls are of golden yellow brick in two shades, broken by large triple windows. The building presents a massive appearance, but the sharp angles have been skillfully softened



New General Office Building of the Southeast Missouri Telephone Co., Cape Girardeau, Mo., Which, Together with New Kellogg Central Office Equipment, Represents a Total Investment of $250,000.—Interior of Main Lobby Showing Cashier's Cages.



John Tlapek, President of the Southeast Missouri Telephone Co., Cape Girardeau, Mo., Has Been Identified with the Company for 28 Years.

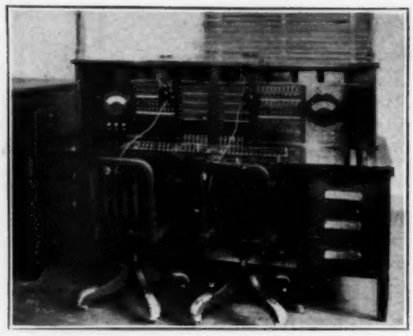
by a trimming of carved terra cotta of a somewhat lighter shade than the brick. The same design in terra cotta has been continued throughout in the pilasters between windows and in the doorways, so that the general tone of the building much more suggests a public library, or other such institution, rather than the home of a business enterprise.

The bronze doors in the massive main entrance open directly into the front lobby where decorations and finish carry out the Italian Renaissance style. Surrounding the lobby are the private offices of the executives and the public business and commercial offices. This portion of the building is wainscoted in paneled walnut which, with the decorative ceilings and walls finished in soft pastel colors, presents a very pleasing atmosphere, both to the employes and to the public.

The employes' entrance is at the side of the building and opens on a small lobby and a stairway to the second floor. To the rear of this lobby the terminal room is located, housing the main frame, relay rack, power equipment, long lines apparatus, and wire chief's desk.

The basement extends the full width and length of the building, and is so arranged as to provide ample air and daylight to the various departments located in that part of the building. Aside from the usual battery room and cable vault, repair shop and storage room, this large space has been used for many conveniences and some novelties.

Locker rooms are provided in this section for all the men, with the additional convenience of a large and comfortably furnished clubroom. The last word in heating appliances, consisting of an automatically-stoked and automatically-regulated boiler, makes possible a white tile boiler room through the elimination of dust and smoke.



Two-Position Kellogg Test Board and Wire Chief's Desk Recently Installed by Southeast Missouri Telephone Co., Cape Girardeau, Mo.

Clara M. Vasterling, General Traffic Supervisor of the Southeast Missouri Telephone Co., Cape Girardeau, Mo., Handles All Matters Pertaining to Traffic for the Entire System.

The second floor is divided between the traffic forces and the general, advertising, plant and accounting departments.

A. Jackson Harty is advertising manager, in which capacity he also edits the "Southeast Missouri Telephone News" and publishes the company's ten directories. J. C. Woody, as general commercial superintendent, supervises all collections, new business and public relations.

The entire rear of the building is occupied by switchboard equipment, operators' restrooms and locker rooms, completely-equipped operators' kitchen and dining room.

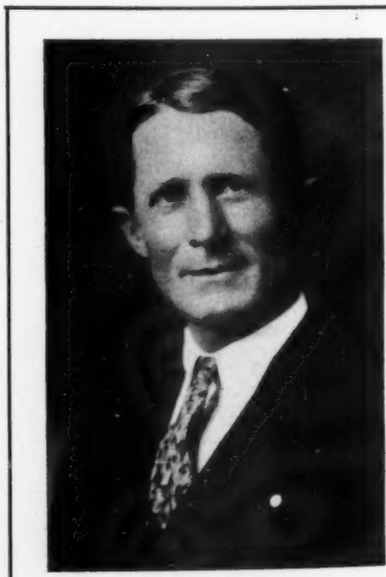
All of the various departments of the Cape Girardeau exchange are connected to a Kellogg P. B. X. switchboard. This board is equipped with ten trunk lines to the main exchange and local lines to a telephone on every desk in the building.

Every fitting and accessory of the building speaks of permanence and efficiency. The present two-story structure is designed to take three additional stories as the requirements may demand. Every convenience is given the employes in their service to the public.

Charles W. Boutin, Vice-President, Treasurer and General Manager of the Southeast Missouri Telephone Co., Cape Girardeau, Mo., Has Been Connected with Company for 24 Years.

The first position of the local switchboard is reserved for rural service and night toll operation. Forty lamp-signal rural lines, 30 toll lines, and 20 pay stations, together with the local-to-rural trunks, make up the incoming line equipment of this position. A full local line multiple and universal cords with machine ringing greatly facilitate the handling of this mixed traffic, and insure excellent service.

Positions Nos. 2 to 7 are equipped for



A. W. Berry, General Plant Superintendent of the Southeast Missouri Telephone Co., Cape Girardeau, Mo., Supervised the Laying Out of All Details of the New Equipment and Building.

Announcing the
Samson Stubbing Clamps
For Economical and Efficient Service

Where strength, rigidity, or dependability are required of old pole lines—stubbing has become the standard practice.

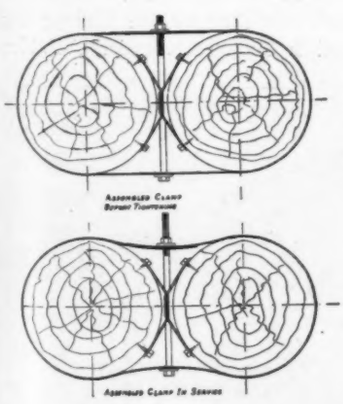
THE NEW SAMSON METHOD OF STUBBING is an efficient system which is gaining high favor by its economy and adaptability. REQUIRES 75% LESS LABOR!

SAMSON clamps may be installed at a saving that pays for their use; being Hot Dipped Galvanized, the salvaging of these clamps is practical. Their use again and again is possible because of their sturdy construction.

The complete unit consists of a Clamping Band and Saddle.

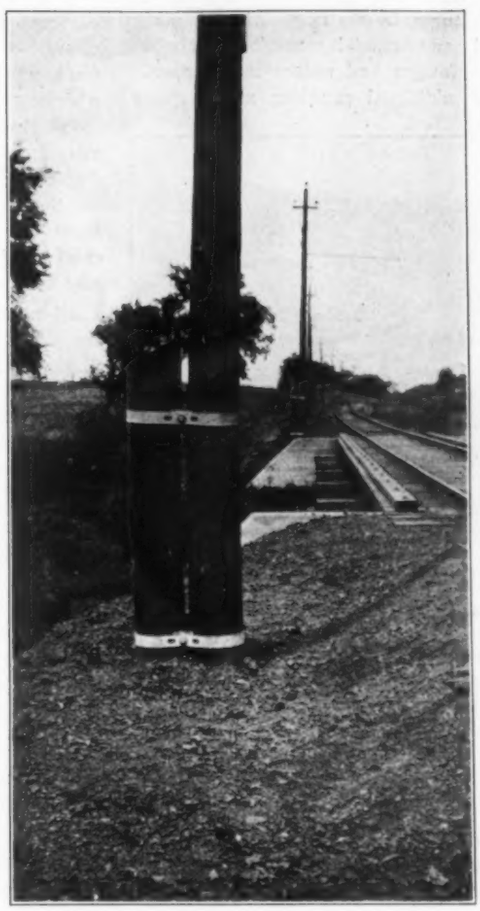
THE SADDLE is securely placed between pole and stub, prevents rolling, permits drying and readily supports weight of pole on stub.

THE CLAMPING BAND encircles pole and stub. A series of holes permits ample adjusting. 5/8-inch thru-bolt of proper length is used through band and saddle for taking slack and holds the combination rigid and secure. See illustration at left showing clamp in position before and after bolt is tightened.



Made in two sizes—No. 1 (Giant) for use on poles from 13 to 18 inches in diameter; No. 2 (Junior) for use on poles from 7 to 13 inches in diameter.

Economy alone will pay for these clamps on your lines. Write for full details.



(Patented July 26, 1927—No. 16688)

SAMSON CLAMPS—supporting 22K.V. transmission line, 2 telephone lines, 4-0 trolley, 10 ft. arms and 35 ft. pole. A striking example of the strength which may be obtained from old poles with these economic clamps.

SAMSON MANUFACTURING CO.
CENTERVILLE . . . . IOWA

Distributed by Leading Jobbers of Line Material

When writing to Samson Mfg. Co., please mention TELEPHONY.

high-speed local operation. Prompt answers on original and recalls are assured by multiple call distribution and line-lamp recall. Quick response by the called party is assured by machine ringing, while the reverting tone assures the calling subscriber that his wants have received attention. Keyless listening and a positive busy lock-out insure all communications against interruption. Instantaneous disconnect assures a complete release of all equipment and the removal of all busy tests at the completion of the conversation.

While providing the rapid and popular service from the subscriber's standpoint, these features, by the elimination of many physical and mental functions, abolish operator fatigue and reduce traffic costs.

Three additional positions are in place

Two-Position Chief Operator's Desk Now in Use by the Southeast Missouri Telephone Co., Cape Girardeau, Mo.

in anticipation of increased business. At the present time these sections are not equipped nor required to handle the 2,300 local lines.

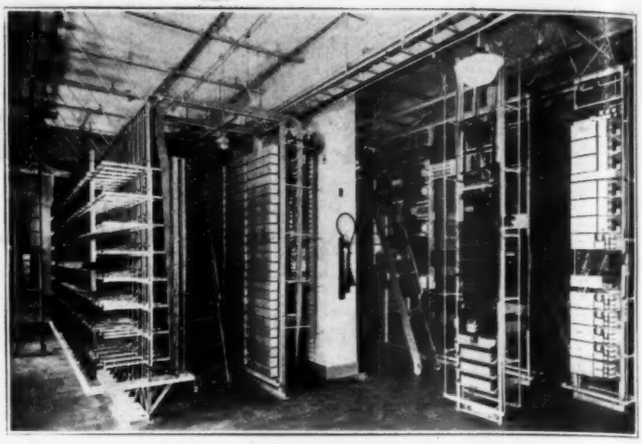
The toll board is located in the same room with the local equipment. This equipment is also modern in every respect and is designed for service and efficiency. Four positions are equipped with a complete local multiple within reach of each operator. Calculagraphs alternate between each two positions, and rate and route information is held under full-width glass bulletin holders in the keyshelf of each position.

A two-position information and chief operator's desk is equipped with all modern devices for these classes of service. Complete service-observing and monitoring facilities are included. Peg-count meters are mounted in the face of the turret and operate automatically from the local cords. In this way the chief operator is at all times advised of the load carried by each position.

All matters pertaining to traffic are under the competent supervision of Miss Clara Vasterling, general traffic supervisor for the entire system. Miss Vasterling's office is located on the second floor and capably managed by her two assistants during her frequent trips to other parts of the territory.

The mechanical operation of all central office equipment is in charge of Equipment Engineer Joseph Burciaga. Wire Chief Alvin M. Kempe has direct control of the maintenance of the Cape Girardeau switchboard and apparatus. Mr. Kempe's desk is located conveniently in the main apparatus room on the first floor.

The arrangement of apparatus in this room is ideal from an installing and operating standpoint. With all equipment and iron work finished in gleaming aluminum and generously lighted by the big windows, a more pleasing appearance would be hard

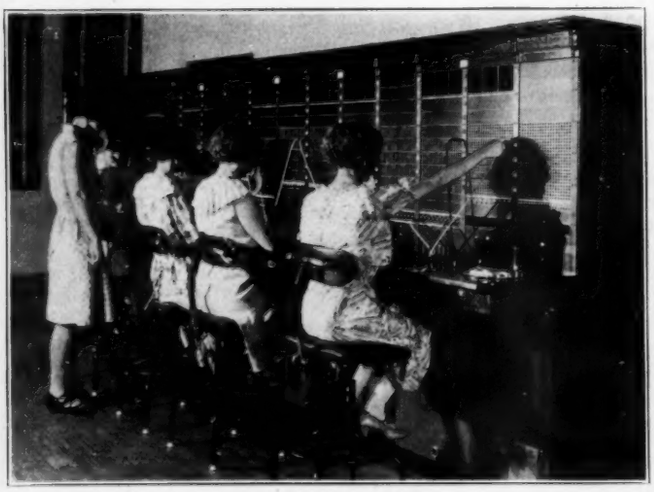


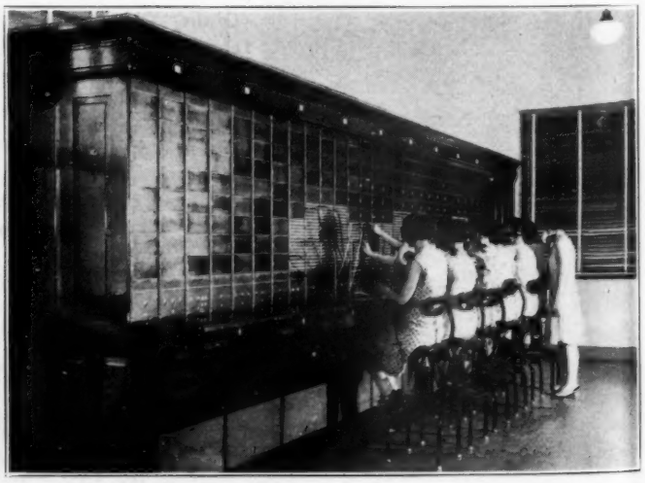
View of Terminal Room at Cape Girardeau Exchange of the Southeast Missouri Telephone Co., Showing the Main Frame, Relay Rack and Long Lines Equipment Which Serve the New Kellogg Switchboard.

to imagine. Outside cables, from the underground vault, enter through the floor at the base of the main frame. Other cables are laid with exactness on overhead racks to the point where they enter the ceiling on their way to the switchboards on the floor above.

Power wiring is mainly in conduits laid in the floor and is visible only where it comes to the big ebony asbestos power panel and other equipment. The storage batteries are located in a well-ventilated battery room in the basement.

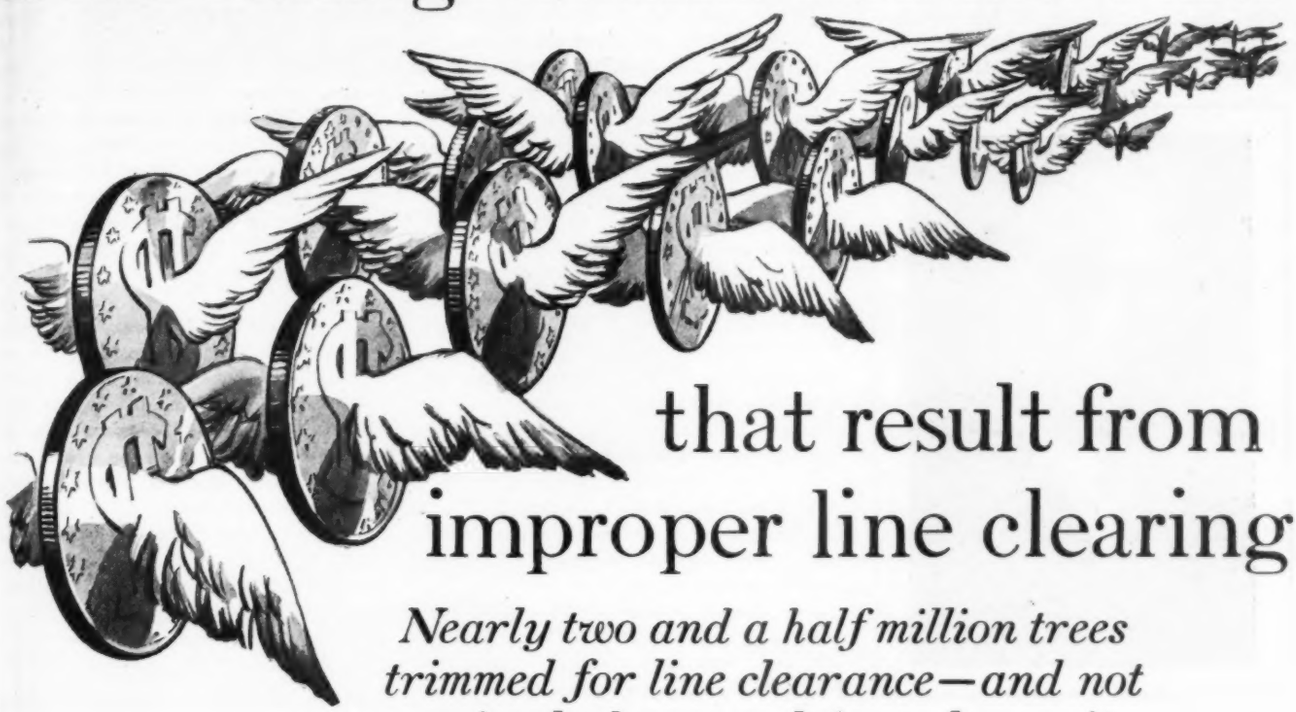
With the exception of the long lines apparatus, practically all central office equipment was furnished by the Kellogg Switchboard & Supply Co. of Chicago. A. W. Berry, general plant superintendent of the Southeast Missouri Telephone Co., spent a great deal of time in laying out all details of equipment and building and is largely responsible for the perfect appearance and operation of the new equipment. Mr. Berry and Mr. Burciaga were both active in the supervision of the installation which was done by the Kellogg Switchboard & Supply Co. under C. F. Howard.





Front View of New Kellogg Four-Position Toll Switchboard with Operators at Their Positions, Which Has Been Installed by the Southeast Missouri Telephone Co., Cape Girardeau, Mo.—New Kellogg Nine-Position Local Switchboard in Cape Girardeau Exchange.

Stopping the loss from damage claims and law suits



that result from improper line clearing

Nearly two and a half million trees trimmed for line clearance—and not a single damage claim or law suit

IT is not necessary to go into detail as to the trouble and annoyance that ordinarily result from line clearing activity, not only with reference to actual law suits, but more particularly in the settlement of damage claims. Perhaps if the overhead cost and the legal expense were added to the cash outlay, the amount would be an impressive total.

In the last few years Davey Tree Surgeons have trimmed nearly two and a half million trees for line clearance for numerous wire companies, and no utility has ever had a law suit or paid a single damage claim as a result of Davey work.

The reasons for this are not hard to explain. Public confidence in the Davey Organization makes it possible to secure permission for the tree trimming in nearly every case without difficulty. Davey Tree Surgeons never abuse this confidence. They do their work skilfully and quickly. They secure adequate clearance with the minimum of cutting. They leave the tree owner satisfied and pleased.

Damage claims and law suits are avoidable through expert Davey service; therefore, they represent an unnecessary leak and an unjustifiable financial burden. The official worry and the overhead cost of these things are also avoidable.

When you consider that Davey men do the actual line clearing work at surprisingly low average cost, fairly comparable to the actual cost under less favorable auspices, it is apparent that a very substantial saving can be made by the elimination of damage claims and law suits.

It is not improper, also, to suggest another extremely important incidental benefit, which is the creation of positive goodwill and the friendly attitude of tree owners along your lines. What advertising expenditure could you make that would produce equal results in goodwill? Here is a result that you get without added cost, by the use of Davey Tree Surgeons for your whole line clearing problem.

Write or wire Kent, Ohio, for full information. Branches and representatives in all principal cities.

JOHN DAVEY
1846-1923
Father of Tree Surgery
Reg. U. S. Pat. Office

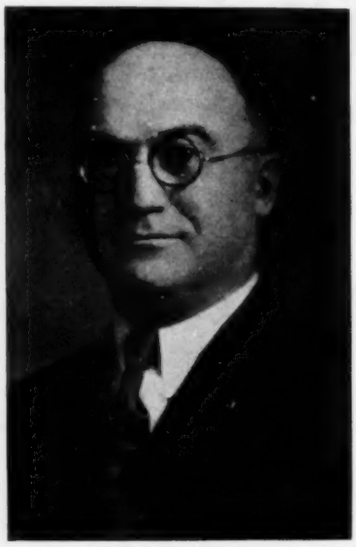
THE DAVEY TREE EXPERT CO., Inc.,
526 City Bank Bldg., Kent, Ohio

DAVEY TREE SURGEONS

MARTIN L. DAVEY, *President and General Manager*

Personal Notes from the Field

James N. Cox, Cookeville, Tenn., president and general manager of the Gainesboro Telephone Co., was honored last spring with presentation of a bronze tablet by the employes of the company. This was placed in the new building of the company as a memorial to Mr. Cox's 34



James N. Cox, Cookeville, Tenn., President and General Manager of The Gainesboro Telephone Co., Honored With the Presentation of a Bronze Plaque by Employes, Which Was Placed in the Company's New Building as a Memorial of His 34 Years of Service to the Company.

years of service with the company. The formal opening of the company's general office building and the presentation of the tablet was quite an appreciative occasion on April 7, 1930, and was participated in by the local Lions Club and a number of prominent telephone men.

As a memento of the occasion, Mr. Cox has just issued a booklet in appreciation, which is dedicated to his family and friends and to his associates in the telephone industry. The frontispiece of the booklet is a reproduction of a photograph of the bronze tablet which reads: "This tablet is dedicated by associates and fellow employes to James Nathaniel Cox, who, serving in every capacity from operator to president, has by his loyalty and progressive leadership, directed the Gainesboro Telephone Co. from its organization in 1896 to its present development; and largely through whose efforts this building has been erected."

The center pages are given over to two photographs—"1900, Looking Toward the Future," and "1930, Reviewing the Past." Both photographs show Mr. and Mrs. Cox as they appeared in those respective years, and indicate that the intervening years have been kind to them both. The last page of the booklet is given over to a photograph of the new telephone building in Gainesboro.

In the booklet are given the entire proceedings of the meeting, together with telegrams and letters which Mr. Cox received from prominent telephone men.

Not only did the occasion mark the dedication of the new telephone building, but it also marked the 33d wedding anniversary of Mr. and Mrs. Cox. In the course of his response to the presentation speech by Leland Hume, former vice-president of the Southern Bell Telephone & Telegraph Co., Mr. Cox paid this tribute to his wife: "It has been said that a mother or a wife has been back of every man's success; and if my life work may be accounted for anything, it is because I have had the faith and love of both mother and wife."

Mr. Cox then gave a resumé of the history of the Gainesboro Telephone Co. from its organization in 1896 to the present time, and it forms one of the many interesting sections of the record.

The booklet is bound with a handsome heavy brown paper cover. The friends of Mr. Cox, who have received it, will undoubtedly treasure it as a real event in the life of Mr. Cox and the company with which he has been connected so many years.

Obituary.

Dr. Edward W. Bemis, of Chicago, noted as an economist and appraiser of public utility properties, died on September 25 at Springfield, Mo., at the home of his daughter, Mrs. Frank Doubler, where he was visiting. He was 70 years old. Death was due to heart trouble, from which he had suffered for more than a year.

Dr. Bemis was a prominent figure in many famous litigations between communities and public utilities, notably the Illinois Bell Telephone Co. Chicago rate case in 1911 and 1912, and the city of Chicago against the Peoples Gas Light & Coke Co. in which he was the sole appraiser for the city. He was also appraiser in the Indianapolis Water company case, which was carried to the United States Supreme Court, where his recommendation in the matter was upheld.

Born at Springfield Mass., on April 7, 1860, Dr. Bemis was educated in the East, taking two degrees at Amherst and one at Johns Hopkins. For three years he was on the faculty of Vanderbilt university as professor of history and political economy, was for the same length of time professor of political economy at the University of Chicago, and later went to Kansas State Agricultural college as professor of economics. For a number of years he was superintendent of water supply at Cleveland, Ohio, and for a short time was deputy commissioner of water supply in New York City.

Dr. Bemis was on the executive committee of the Public Ownership League and was a member of the University, Cosmos, and City clubs, and of Phi Beta Kappa, honorary scholastic fraternity.

W. R. Warren, of Regina, Sask., Can., deputy minister of telephones for Saskatchewan, passed away at Vancouver, B. C., on September 12 after a lengthy illness. He had been in poor health for a long time, and had been spending some time in Vancouver in an effort to recuperate.

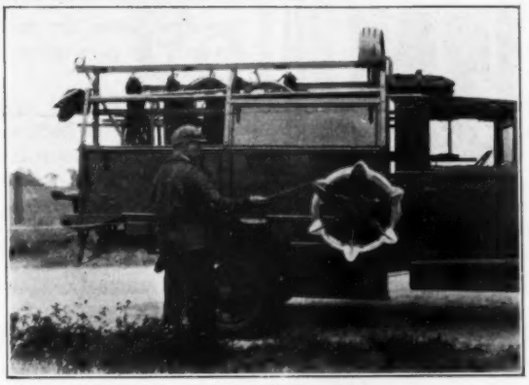
Born in Bristol, England, Mr. Warren went to Canada as a young man. It was at Winnipeg, where he first settled, that he entered the telephone field, being associated with the Bell telephone company there. He continued with the Manitoba system after it went into the hands of the government.

Upon recommendation of F. C. Paterson, district commercial superintendent of the British Columbia Telephone Co., at Victoria, then with the Manitoba telephone organization, Mr. Warren was taken from a wire chief's position in Winnipeg to be chief engineer of the Saskatchewan system. He later became deputy minister of telephones.

The Late W. R. Warren, Deputy Minister of Telephones for Saskachewan, Was Well Known Among the Telephone Men of Canada.

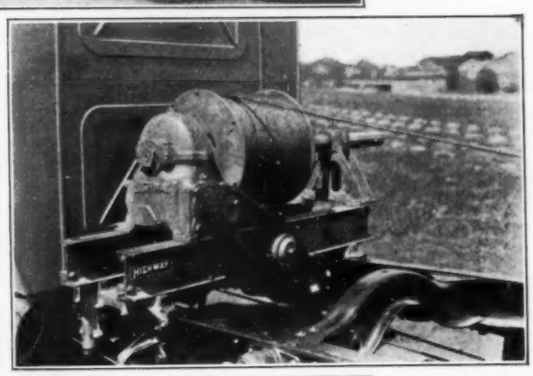
At the annual convention of the Canadian Telephone Association in September, 1926, Mr. Warren was elected president for the following year, taking office on January 1, 1927. At that time he was chief engineer of the Saskatchewan system.

Highway Li-Body for ¾-Ton Chassis



Highway Collapsible Reel for Picking Up Loose Wire

Highway Model H Body—Arranged for Telephone Service



Highway L12 Winch for 1½ and 2-Ton Chassis

Highway Model "D" Boring Machine Use with Trucks or Tractors

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WINCHES—

Heavy duty horizontal, light horizontal, Capstans, Propeller Shaft Power Take-offs, S. A. E. Take-offs and numerous accessories used in winch operation.

BODIES—

Several models all adapted to any make or model truck—all steel or combination steel and wood, body accessories used daily in line construction and maintenance.

DERRICKS—

All styles and sizes, middle types, corner types, and the highway "Automatic" types, with underground attachments and other accessories.

EARTH BORING MACHINES—

In two sizes—truck or tractor mounted—digs in clay, shale, hardpan and frost and sets the pole — cuts construction and maintenance costs in half.

HIGHWAY TRAILER CO.

Home Office At Edgerton, Wis., U. S. A.

Type 30—A New Strowger Development

Description of New Method of Mounting and Grouping Dial Telephone Exchange Equipment, Offering Desirable Economies in Equipment and Floor Space Requirements—Details of Development and Salient Features of Design

By E. R. Neir,
Assistant Chief Engineer, Automatic Electric Inc.

Improvements in the design of Strowger automatic telephone apparatus which at the time are usually considered as appertaining only to the individual piece of apparatus involved, often have far-reaching effects. This was recently demonstrated by the development of the new self-aligning plunger line switch, which has now culminated in the design of a new arrangement for mounting and grouping Strowger automatic telephone equipment.

Prior to the advent of the new self-aligning switch, the plunger line switch was of the "pick-up" type—its name being derived from the fact that it contained a slotted fan-tail plunger which, after being disengaged from a bank connection, was picked up by a flanged guide shaft controlled by a master switch. Because of adjustments which were required in setting the plunger and in aligning the switch to its associated bank, and vice versa, it was desirable that pick-up type line switches be mounted in a horizontal plane, one above another.

The principal design feature of the new line switch was the automatic, instantaneous self-aligning of all idle plungers of a group of line switches. This and other operating refinements, plus the simplicity of construction of both the new line switch and its associated bank, eliminated the intermittent pick-up operation by the flanged guide shaft, and the adjustment of the bank to the line switch. These improvements permitted the line switches to be mounted vertically, side by side, on horizontal shelves—the same as other units of Strowger automatic equipment.

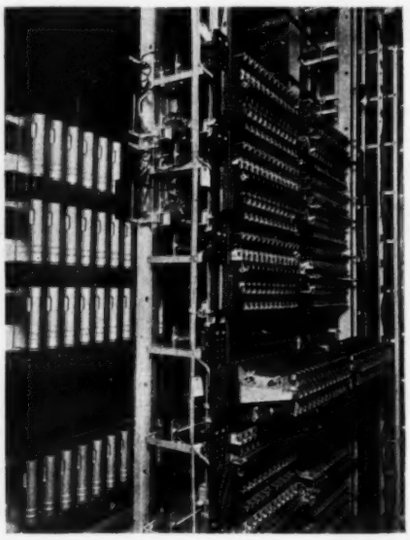


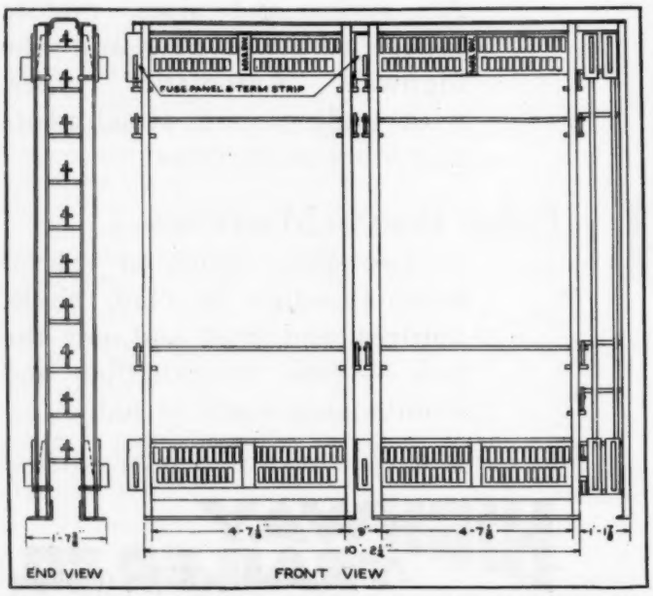
Fig. 1. Type 30 Plunger Line-switch Rack Showing One Shelf Lowered.

The new line-switch shelf, which is shown in Fig. 1, is arranged to be mounted on a double-sided rack of the construction illustrated diagrammatically in Fig. 2. Heretofore, other units of automatic equipment were ordinarily mounted on single-sided racks, but the fact that the plunger line-switch shelf had always been of the hinged type enabled a double-sided rack to be employed for the new line-switch mounting, since the shelf could be swung forward to gain access to the wiring on the rear.

A saving in floor space was, therefore, not only realized because of the design and of the new line-switch shelf, but also because of the double-sided method of mounting the shelves. It was, therefore, obvious that if double-sided racks could be consistently employed for mounting other units of automatic equipment, such as selectors, connectors, etc., further economies in floor space and cabling were possible.

With these ideas in mind, impetus was given to the development of double-sided racks for the mounting of selector and connector shelves. These shelves, because of their weight, could not be made to swing forward like the line-switch shelf. However, it was necessary to provide means for gaining access to the wiring of the banks, even though this access would probably be required on an average of less than once a year.

The problem was solved by the design of connector and selector racks, shown diagrammatically in Figs. 3 and 4, respectively, on which racks the shelves are supported by partially threaded rods, as shown in Fig. 5. This arrangement permits the shelves to be raised or lowered, since the shelves are held in place on the rods by means of hexagonal nuts.



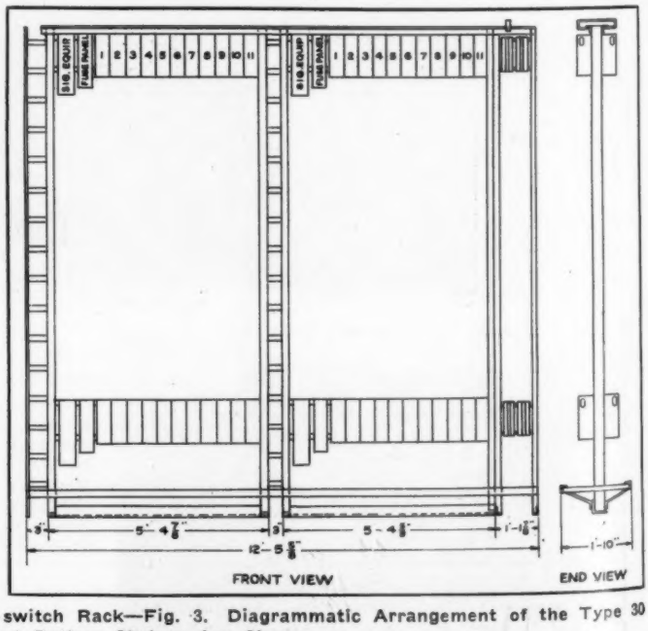


Fig. 2. Diagrammatic Arrangement of the Type 30 Plunger Line-switch Rack—Fig. 3. Diagrammatic Arrangement of the Type 30 Connector Rack. Only Top and Bottom Shelves Are Shown.

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are very serviceable, and are available in substantial quantities, particularly in the shorter lengths.

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find wide use where length and straightness are required. We are in excellent position to furnish this species also.

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pressure treated, give excellent service and make a good appearance in the line.

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AMERICAN FOREST PRODUCTS COMPANY, Inc.

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An adjusting lever, Fig. 6, is employed to raise and lower the shelves. The hook end of this tool engages a hole in the front plate of one of the end members of the shelf, while the other end of the tool rests upon the upper bracket of the threaded rod. Thus by pushing upward on the handle, the corresponding end of the shelf can be raised.

The desired position of the shelf end is maintained by twirling the hexagonal nut until it assumes the position in which the shelf is to be held. The opposite end of the shelf is then raised in a similar manner. A clearance of four inches between two adjacent shelves can be obtained by raising and lowering the shelves, as illustrated in Fig. 7. This clearance provides sufficient space to reach the bank wiring.

In designing the line-switch and connector shelves for the double-sided racks, ordinary distributing frame terminal blocks were employed for terminating the cables to the switches and the wires from the switch banks. The selector shelves were designed in the same manner, with the general exception that the wires from the banks were terminated on special pin blocks forming a distributing terminal assembly. Constructing the frameworks in this manner facilitates the standardization of shelf construction, and correspondingly increases the flexibility of mounting and interconnecting arrangements.

Since terminal blocks of the types as used on intermediate distributing frames were employed on the ends of the switch shelves, experiments were conducted toward their utilization as a part of the line intermediate distributing frame, and thus avoid the necessity of running cables between these blocks on the shelves and corresponding blocks on the line intermediate distributing frame. It was also anticipated that a further economy could be secured by eliminating the line intermediate distributing framework, and associating the switch shelf blocks with the main distributing frame.

The result was the development of a new type combined main and line intermediate distributing frame as shown in Fig. 8. The protectors were mounted on the front, or line side, and the line-switch and the connector racks were butted against the rear of the frame at right angles. The line-switch and connector rack rows were placed alternately, with the bank-cable terminal-block end of the connector shelves and the line-terminal-block end of the line-switch shelves abutting directly against the framework.

The outside, or street, cables were terminated on the protectors, and jumper wires were run from the protectors to the connector terminal blocks, and from these blocks to the line-switch terminal blocks.

Fig. 9 shows a close-up view of the protector side of a typical installation of the new frame, and illustrates the general manner in which the jumpers are run. A frame of this type provides all the facilities of a separate full line intermediate distributing frame, plus a direct saving of runway, cabling, and terminals, and a reduction in floor space.

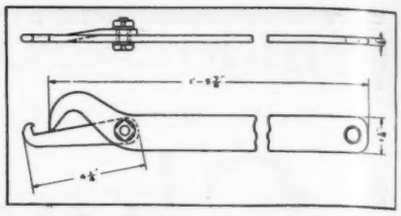

Fig. 6. Shelf-Raising Lever.

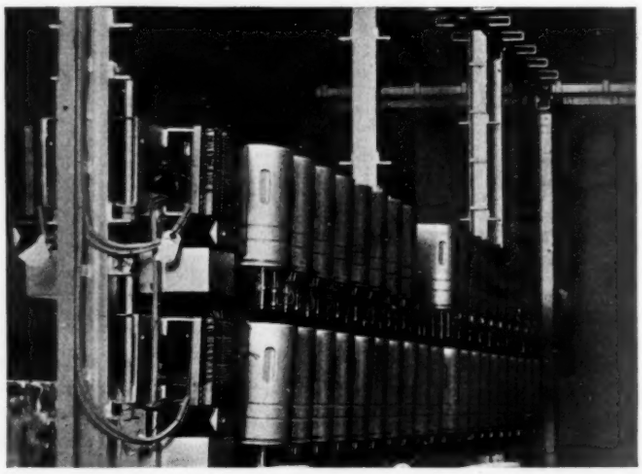

Fig. 5. View Showing Method of Mounting Selector and Connector Shelves on Type 30 Racks.

This type of equipment is known as the Type 30 Strowger automatic telephone equipment. The code number applied relates particularly to the mechanical design of the frames, racks and shelves. It does not necessarily pertain to the circuits of the switches or the trunking principles employed, since the equipment is equally applicable for all standard circuit and trunking arrangements.

The manner in which the equipment is grouped to conserve floor space, and at the same time allow sufficient aisle space for maintenance purposes, is illustrated in Fig. 10, which shows a typical floor plan arrangement for an exchange having an ultimate capacity of 6,000 lines. This sketch clearly illustrates the manner in which the terminal blocks on the ends of the primary line-switch racks and the connector racks unite with the distributing frame to form a combined main and line intermediate distributing frame.

The racks, frames, etc., are manufactured in two heights, one of approximately 9 ft., and the other of 11 ft. 9 ins., for buildings having low and high ceilings respectively.

The salient features of design incorporated in the Type 30 equipment may be summarized as follows:

(1) The combining of the main distributing frame and the line intermediate distributing frame into a single unit, thereby requiring only the floor space ordinarily allotted to the main distributing frame, and affecting, in addition, a saving of a complete set of line terminal blocks and a full run of line cables.

(2) The locating of the line-switch and connector switch racks in alternate parallel

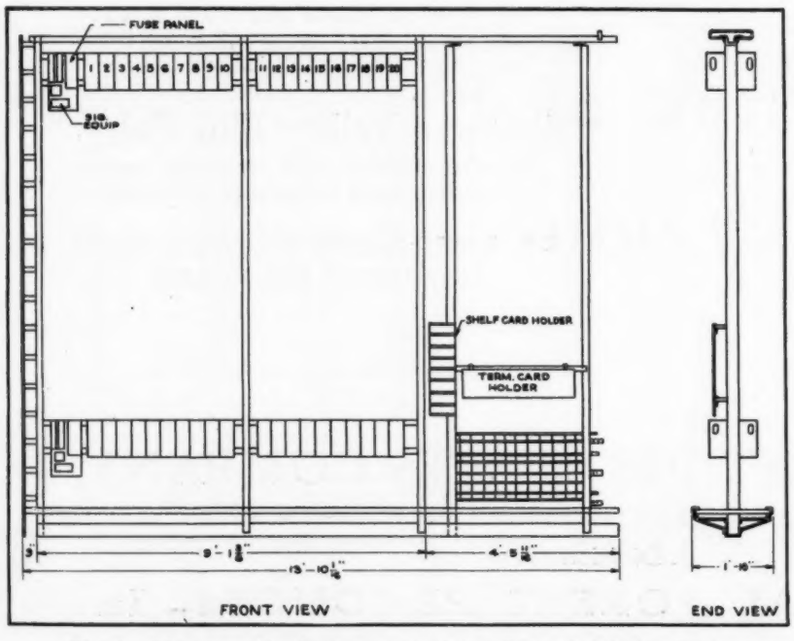

Fig. 4. Diagrammatic Arrangement of the Type 30 Selector Rack.

For Toll or Service Billing

Telephone companies everywhere have found that Burroughs machines provide speedy and economical handling of toll as well as service billing and other kinds of accounting.

Burroughs

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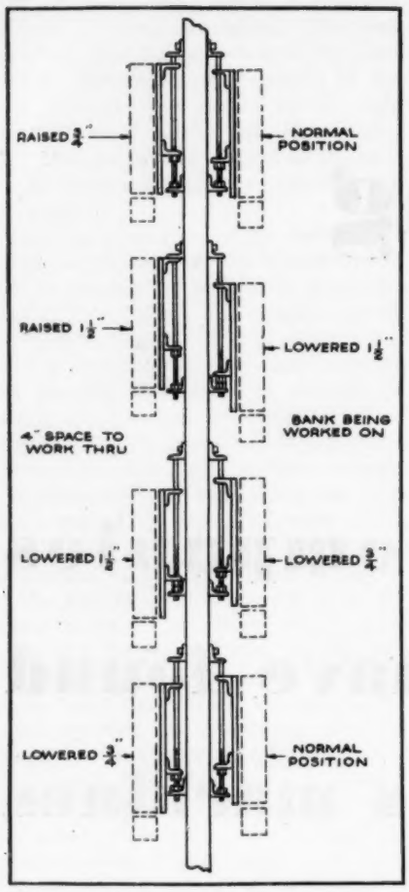


Fig. 7. Sketch Showing Manner in Which Shelves Are Raised and Lowered to Gain Access to Rear of Any Bank.

rows at right angles to the distributing frame, and the butting of these rows of switch frames directly against the switchboard side of the distributing frame without providing an intervening aisle. This arrangement permits the cabling from the switches to be terminated directly on the switchboard side of the combined distributing frame, thereby saving, in addition to the floor space ordinarily allocated for an intervening aisle, a complete set of line and connector bank terminal blocks and a full run of line and connector bank cables.

(3) The mounting of the line and trunk switches on both sides of frames, i. e., double-sided racks. This arrangement provides mounting space for a greater number of switch shelves for any given ceiling height. Access to the wiring side of the line-switch banks is obtained by means of hinged shelves, and to the wiring side of the selector and connector switch banks by means of a shelf-raising and lowering device.

(4) The establishment of each switch shelf as a complete, self-contained unit, with all local jack and bank cabling connected to terminal blocks mounted on the shelf. Interconnection with other shelves of equipment is accomplished by means of flexible jumpers or cabling. The switches may, therefore, be readily regrouped to meet changes in traffic conditions, or the shelves may be relocated, or additional shelves installed, as occasion demands. Hence, only a minimum of equipment is required.

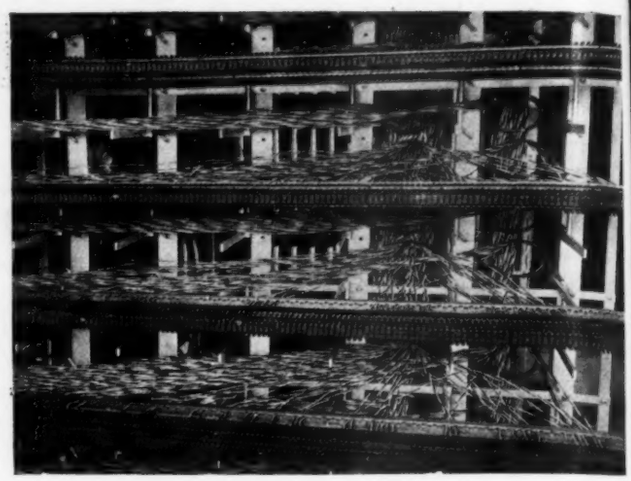


Fig. 9. Close-up View of Protector Side of Combined M. D. F. and L. I. D. F. with Jumpers in Place.

The equipment embodies the same switching units as were formerly used; therefore the class of service rendered by the Type 30 equipment will be of the same high standard as that previously given; i. e., a class of service comparable to that now being furnished to the subscribers of the numerous Strowger dial exchanges located throughout the world.

The paramount advantages of this type of equipment are a reduction in floor-space requirements with a corresponding reduction in building size; a saving in racks, runway, terminals, cable, and installation labor; and full L. I. D. F. facilities to permit regrouping of equipment to meet changing traffic conditions.

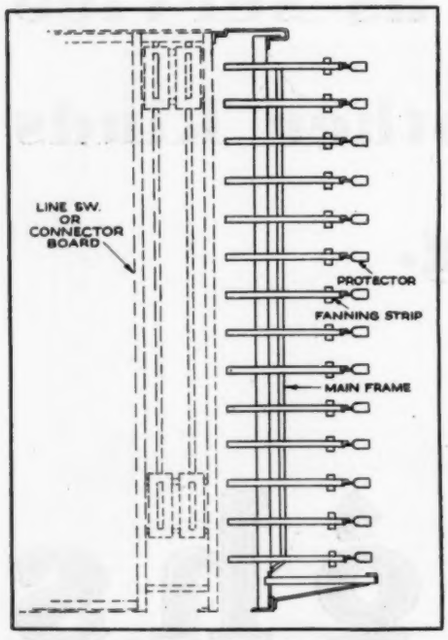


Fig. 8. Cross-Sectional View of Combined M. D. F. and L. I. D. F.

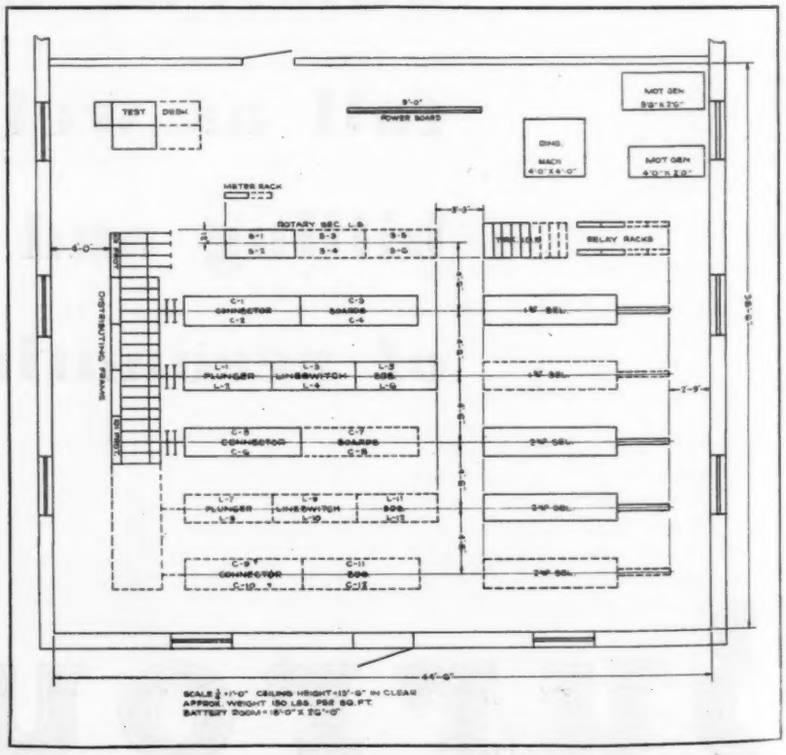
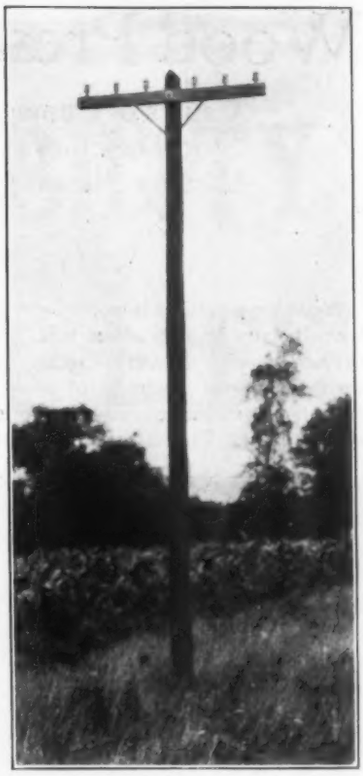


Fig. 10. Typical Floor Plan Arrangement of a Type 30 Central Office, Having an Ultimate Capacity of 6,000 Subscribers' Lines.

BROWN Treated Poles for Strength and Service

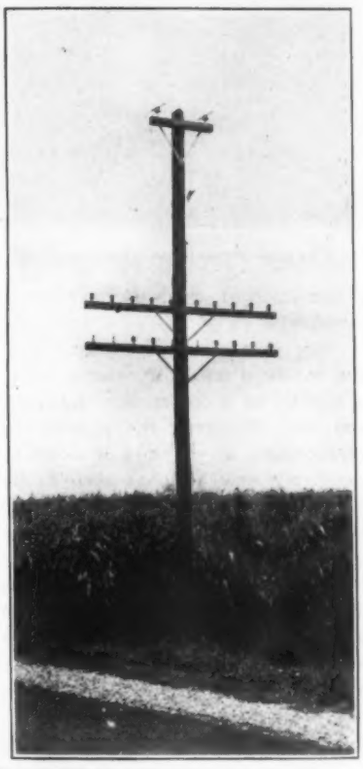


The problem of extending service facilities to reach the new potential customers, and yet to accomplish this at a cost not prohibitive—this is a problem confronting today practically every telephone man.

Poles necessarily enter into this problem. To find just the right source of supply for good poles is itself an aid in solving it. This means good, long-life poles that exactly meet requirements as to quality, price, and delivery, and dependable uniformity.

The Brown Wood Preserving Co. is working closely with the Industry to aid them in their rapid, economical extension of pole lines.

The poles produced, treated and marketed by the BROWN organization are Creosoted Dense Southern Yellow Pine, the finest type of pole available for the purpose.



In this work of supplying the pole needs of the Telephone Industry, the Brown Wood Preserving Co. is advantageously situated by reason of the extensive Pine timber holdings assuring future supply of poles and the operation of two modern treating plants and pole yards at Brownville, Ala. and at Louisville, Ky.

This company, practically unique among pole companies, operates as a "one-organization straight-through". Having its own pole lands, it employs its own crews in the cutting, inspection, transporting, framing and treating of poles, and this "new deal in poles" enables BROWN to render the Telephone Industry a service in economy in costs, uniformity in quality and promptness in service.

Try BROWN on your next pole requirements.

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4th & K Streets, Louisville, Kentucky
Long Distance Telephone—Magnolia 2407

BROWN

CREOSOTED YELLOW PINE PRODUCTS

300,000 Acres One of the largest

Individual Holdings in America

Wood Preservation and Telephone Poles

Causes of Damage to Poles from Fungi and Termites—Methods Followed to Stop Their Growth—Treating Starts with Cutting of Timber—Address Before District Meeting of the Texas Independent Telephone Association at Tyler

By C. M. Tilley,
Superintendent of the Texas Creosoting Co.

Wood preservation is not a new industry. It dates back to about 1657, when a German named Johann Glauber experimented with the treatment of wood with vegetable pyroligneous acid to protect it against decay. This is the first attempt at preservation of which we have any definite knowledge.

Fungus Growth on Untreated Wood.

Since then almost everything under the sun has been tried to preserve wood, even a mixture of a decoction of tobacco leaves and tar. However, the science of wood preservation, as we know it today, is comparatively new and has been brought to its present state of perfection within the last generation.

In 1875, the Louisville & Nashville Railroad built a plant at Pascagoula, Miss., for the treatment of piling and bridge timbers. This was one of the first plants to be built in this country for the pressure treatment of timbers with creosote oil, and it was one of the forerunners of modern wood preservation.

The first step toward a comprehensive knowledge of what is necessary for preserving wood is to know what causes the damage to the pole. There are, roughly speaking, two main causes of pole failures. The first and most common is what we know as rot.

A good deal of study has been put on rot and its causes, and it has been found that rot is a disease in wood caused by germs, which are known in their fruiting stage as fungi. These germs are carried from place to place by the wind and other agencies, making rot as contagious as germ diseases in the human organism.

These fungi are divided into two classes: Harmful, which live on the lignins and cellulose, in the wood; and non-harmful, which live on the sugar and starches and do not damage the wood structure but indicate an ideal condition for the growth of the harmful varieties.

The modern wood preserver recognizes the danger of contagion. Well-regulated plants are careful to keep down infection as much as possible by keeping their yards clear of rotting wood, and the weed growth to a minimum around the stock piles. It is essential that the timber to be treated shall be free from mycellia, which are the first stages or roots of the fungi.

The second class of wood-destroying organisms is the insects, by far the most interesting and fatal of which are the termites. These white ants, as they are sometimes called, are becoming more and more a menace, not only to pole lines but to any other structure which is built of untreated wood.

Termites at one stage of their development grow wings and swarm similar to the swarming of a colony of bees. They are becoming more widespread each year, and the only permanent protection against them known at the present time is a thorough treatment with creosote oil or some other standard preservative.

Having studied the causes of pole failures and finding that they are caused by living organisms, both vegetable and animal, the next logical step is to find some substance or method by which the growth of these organisms can be stopped. The most obvious one would be to poison the food supply of these organisms. As they attack the wood primarily for food, the natural solution would be to poison the wood by injecting a toxic directly into it, thereby stopping the growth of all wood-destroying organisms and protecting the timber against failure indefinitely.

One of the Many Reasons Why Telephone Men Should Use Treated Poles.

This, however, is not so easy and simple as it would at first seem. To be toxic or poisonous to fungi and other wood-destroyers, the substance has to be soluble to some extent in water. If, on the other hand, it is too soluble, it will leach out and we would not have enough toxicity re-

Modern Creosoting Plant and Yard Showing Stocks of Poles for Seasoning.

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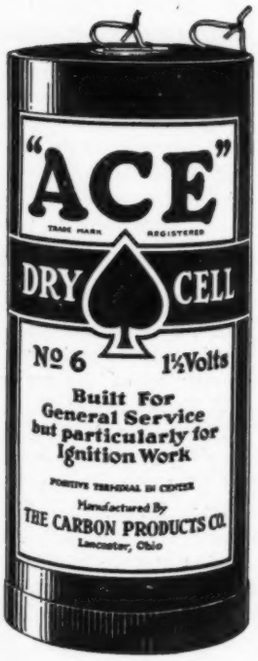
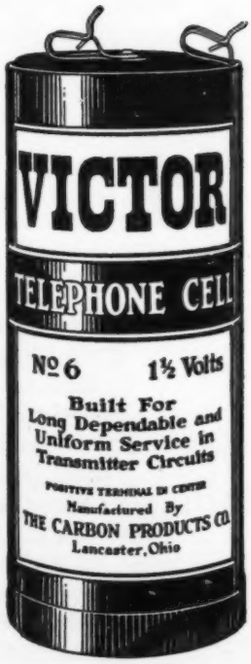
LONGER LIFE





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maining to poison the fungi and termites. Neither can this preservative be too volatile, for structural timber or poles are used where comparatively high temperatures prevail, and a good part of the preservative may volatilize and not leave

Termite Damage on Untreated Pole.

enough of the toxic material to protect the wood against decay.

These and many other considerations had to be mastered before a satisfactory preservative of known worth was available. As previously stated, nearly everything under the sun, which had hopes of preserving wood, has been tried since the inception of wood preservation. By the process of elimination we finally have left two standard preservatives of recognized worth. These more nearly meet the requirements that a preservative must necessarily have than any other. These are creosote oil and zinc chloride.

In creosote oil, we have a preservative of known worth, one which, properly applied, will give an average life to pole lines of from 30 to 40 years. However, there have been some failures which are traceable to the improper injection of the creosote. Unless the oil is properly distributed in the wood, it is almost axiomatic that failure of the pole will occur long before the anticipated life has been reached.

It can be readily seen that treating timber is not simply injecting a preservative into the wood. It starts with the cutting of the timber in the woods and its careful preparation, and only ends when the pole has given a satisfactory life to the company that bought it.

It does not necessarily follow that low-priced poles are always cheap. Unless the manufacturer has something to offer other than a low price, it is well to satisfy yourself regarding the fitness of his products to meet your needs. This is not always easily done, but a pole which has to have a life of from 30 to 40 years to justify its cost, is a rather expensive proposition if it fails in from 10 to 20 years. While you are waiting to find out if it will stand up, you have probably multiplied it by several thousand, and find yourself with miles of lines, which are expensive to maintain or rebuild.

I have heard much discussion of the rural lines at the last several meetings which I have attended, and I believe that the rural line question is a live issue. It seems to be the consensus of opinion that the telephone company should construct, own and maintain these lines, but that they should be built as cheaply as is possible and yet give good service.

This, I believe, is correct, but it does not mean that untreated material for your pole lines and crossarms is necessarily cheap. It is obvious that you can afford to pay three times as much for a pole or crossarm which will last you 35 years than for one which will only last you ten years, for you are at least ahead of the game to the tune of the replacements and resettings necessary with the pole with the lowest first cost.

We have another factor which has been injected into the problem within the last few years, and that is the termite. Some years ago, I went into east Texas to see a telephone manager there. He complained that he had bought a car of untreated poles which he had to reset in less than three years and that he would have to replace them in a year or less. On examination, these poles showed that they had been literally eaten up by the termites and had given him a life of about four or five years; poles which ordinarily should have lasted 15 years.

You are going to find the termites more and more as time goes on, for the experts tell us that they are steadily spreading and getting worse all over the country, and the only remedy seems to be the use of well-treated timber in your pole lines.

Now to the nub of the whole proposition. You are selling service with a capital "S," and service interruptions are something that the telephone man sits up nights to avoid or correct. With the properly treated pole, interruptions from pole failures are cut down almost to the vanishing point, and you can sleep nights instead of going around looking as glum as a delicatessen owner at a cooking school for young brides.

Germany to Establish Radiotelephone with Bangkok, Siam.

Radiotelephone communication with Bangkok, Siam, and with several important Japanese cities will be inaugurated shortly by the German Federal Postal Ministry, according to a dispatch received in the Department of Commerce from Assistant Trade Commissioner A. Douglas Cook at Berlin.

The following list shows those countries with which Germany now has radio telephonic communication, as well as the date of opening of the services: October 2, 1928, United States, Canada, Cuba, Mexico —cable to London, thence radio; October 12, 1938, Argentina—radio direct; December 27, 1929, Dutch East Indies—radio direct; March 16, 1930, Brazil—radio direct; May 19, 1930, Australia—cable to London, thence radio; August 1, 1930, French Indo-China—cable to Paris, thence radio.

Germany maintains cable telephonic service with all European countries except Turkey, Greece, Rumania, Bulgaria and Albania.

Prices in the Metal Markets.

New York, October 6: Copper—Steady; electrolytic spot and future, 10c. Iron—Quiet; No. 2 f. o. b. Eastern Pennsylvania, $17.50@18.50; Buffalo, $15.50@16; Alabama, $11.50@14. Tin—Dull; spot and nearby, 28c; future, 28.20c. Lead—Quiet; spot, New York, 5.25c; East St. Louis, 5.10c. Zinc—Quiet; East St. Louis spot and future, 4.20@4.25c. Antimony, 7.37c.

Pole Stocks Showing Method of Stocking with Creosoted Dividing Strips to Prevent Premature Decay.

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American Electric Presents New Board

Common Battery Switchboard for Small Exchanges Introduced—History of the Design—Analysis of Small Exchange Problems and Difficulties—Description of the New Apparatus—Explanation of Manufacturing Production

By John E. Fisher,

Vice-President and General Manager, American Electric Co., Inc.

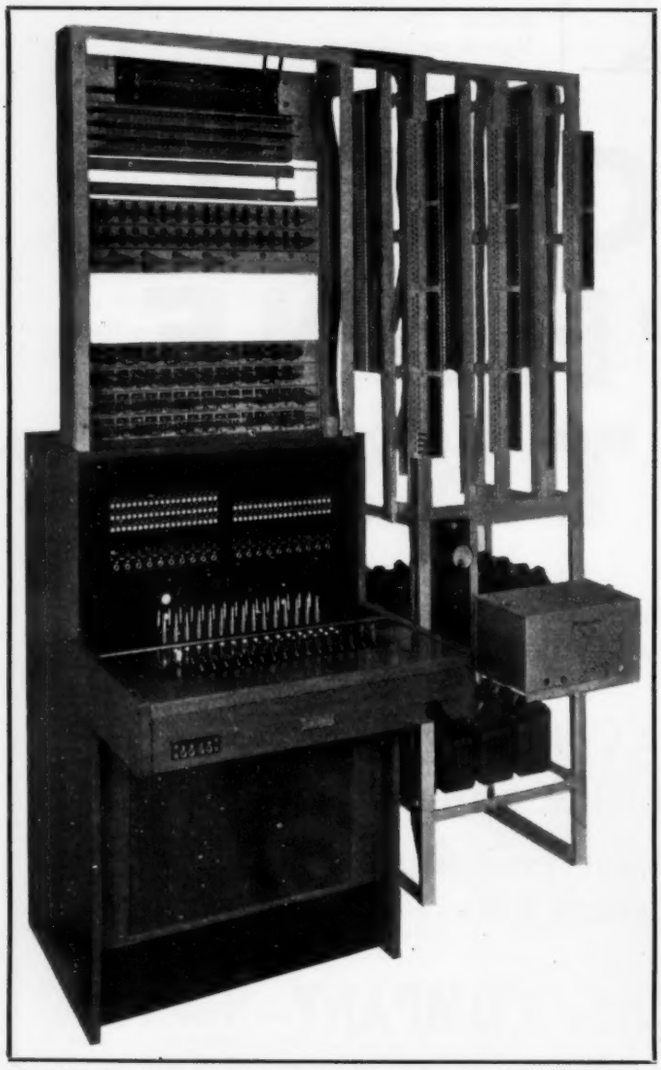
On October 14, a new common battery switchboard is to be introduced to the telephone industry by American Electric engineers—the Monotype Community switchboard. This new unit is a small common battery switchboard designed for exchanges of less than 400 lines, and it embodies many features of design wholly different from those of any switchboard offered before.

It is the belief of American Electric engineers that this new switchboard will not only prove to be the ideal apparatus for the majority of small exchanges, but will also set a new standard for the design of small exchange switching apparatus. To present properly the supporting evidence for this belief, it is necessary to give a short history of the small exchange situation and all the details which played such an important part in forming the concept of this new design.

As every telephone man knows, increasing attention has been given during the past several years to what has been generally referred to as "the small exchange problem." A rough analysis of this problem resolves itself into two factors:

First, that many small exchanges are not producing the proper earnings in proportion to the total capital invested.

Second, that many small exchanges are not giving the proper quality of service to which their communities are entitled.



The New American Electric Monotype Community Common Battery Switchboard for Small Exchanges.

It is only fair to the men operating these small exchanges to state that in nearly every case the second factor has been an outgrowth of the first. To furnish satisfactory service and, at the same time, to show a profit in the small exchange often present even greater difficulties than those encountered in the operation of the larger exchanges.

Fortunately, the increasing dependence of all telephone exchanges upon one another because of the expansion of toll business has revealed the plight of these small exchanges. What was formerly merely the concern of the local company has now become the concern of every one engaged in the telephone industry.

As a result, practically every recent convention of telephone men has

John E. Fisher, Vice-President and General Manager of American Electric Co., Inc.

seen a discussion of the problem, and every trade publication carries some suggestions and formulae for its solution.

However satisfactory local battery service may have been in the past, it is now generally recognized that in hundreds of communities it has outlived its usefulness and that hundreds of small telephone companies are now ready and willing to install central battery equipment.

It is equally self-evident that, in the majority of cases, the obstacles in the way of this conversion are chiefly financial. The cost of rebuilding the outside plant and the purchasing and installing of new switching equipment and telephones impose an extremely heavy financial burden on the small exchange. Certainly, anything that would materially lessen this heavy expense would go a long way toward the solution of "the small exchange problem."

In the opinion of American Electric engineers, this condition has placed an obligation on telephone manufacturers to make every effort possible toward reducing the cost of modern small exchange central office equipment. It is true, also, that during recent years telephone equipment manufacturers have made specific attempts to produce common battery apparatus which would be particularly suited to the small exchange. In applying these designs

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Model F, 1½ Tons

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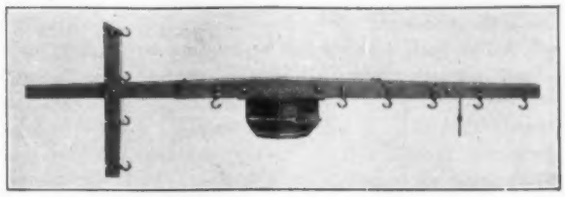
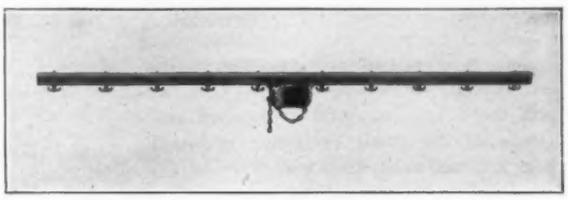
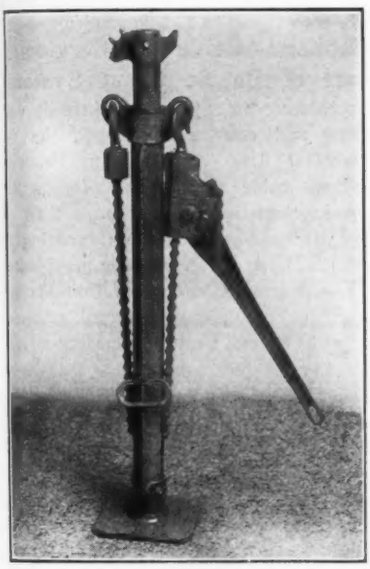


Type 10-B for Telephone Work
Suitable for changing cross arms in straight or phantom circuits.



Type 10-C
for changing cross arms on corners



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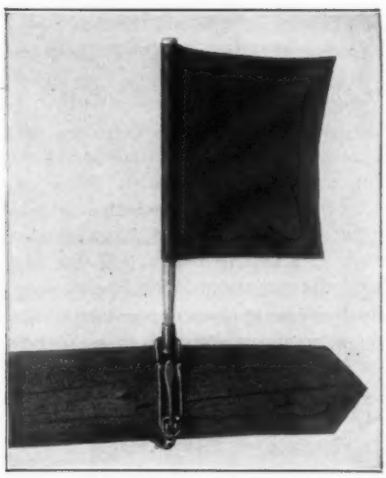
Employ as their operating unit a Model "F" Coffing Chain Hoist. A real jack for pulling or straightening poles.



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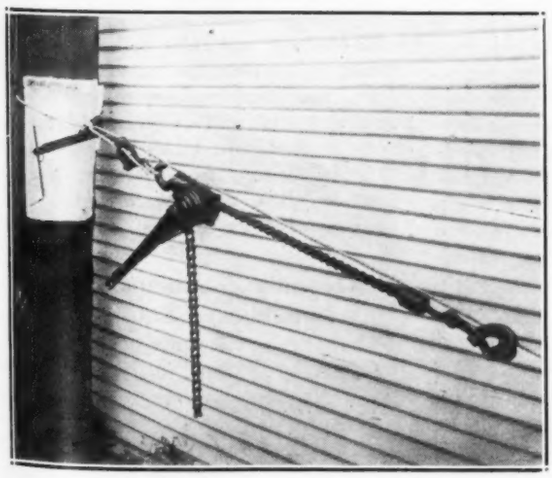

THE COFFING GUY CLAMP & HOIST

The hoist for pulling desired tension and the clamp for necking without damaging the coating on the strand, make this a very desirable pair for hanging guys.

THE COFFING TRANSFORMER GIN

The Problem Solved. A device that can be easily attached to our Temporary Cross Arm Clamp.

This attachment can be used in conjunction with our Temporary Cross Arm if you desire to change old cross arm before hanging transformer; also to support old transformer while changing old cross arm, without disconnecting or letting old transformer to the ground.

The most satisfactory Transformer Gin on the market. For Test, has been clamped within four inches from the top of a flat top pole and lifted more than 2000 pounds with Perfect Satisfaction.

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they have succeeded admirably in some cases.

One telephone man who is thoroughly familiar with the small exchange situation made the following criticism: "Too much effort has been expended in attempting to adapt big-city common battery central office equipment to the small exchange. Merely because a community is smaller, it does not necessarily follow that a relatively smaller switchboard or a fractional amount of the same equipment will satisfy the requirements of the small exchange. On the contrary, actual results in most cases have shown that it is economically impractical.

"Until the small exchange is studied without reference to larger exchanges and until common battery apparatus is designed with the difficulties and the financial limitations of the small exchange in mind, then, and not until then, will there be any concerted action toward the conversion of the hundreds of small magneto exchanges to a common battery basis."

When American Electric engineers turned their efforts toward the solution of this "small exchange problem," the foregoing comment was given thorough consideration, and it was decided that the counsel of operating men who were thoroughly conversant with both the financial and technical difficulties of the small exchange would be desirable.

After months of collaboration with leading telephone engineers of the country and after an exhaustive study of the requirements of the small exchange, the fundamental plan of the new "monotype community switchboard" was evolved. An investigation of the details of this new unit will reveal the soundness of the claim that it is a big step toward solving this age-old telephone problem.

The Switchboard Frame.

As is shown in the accompanying illustration, the switchboard consists of a single unit position with the steel framework extending upward to form the relay rack. A distributing frame similar to the switchboard frame contains the protective and power equipment. The entire apparatus requires little, if any, more space than the magneto equipment it replaces—an important fact, as it assures the installing company that the existing location of the office will satisfactorily house the new equipment.

The ultimate capacity of a single unit is 160 local common battery lines and 40 rural or toll magneto lines. By placing two of these units side by side, they will provide adequate facilities for exchanges up to 400 lines. The distributing frame, with the protective and power equipment, has no physical connection with the switchboard other than the cabling and may be placed wherever desired.

All cord circuits (15 in number) can be full universal when so desired. If the conditions of the exchange do not warrant this number of universal circuits, straight common battery circuits can be furnished in the proportion required. The face equipment consists of strip-mounted lamps and jacks (20 per strip) of the local lines appearing above the drops and jacks of the rural and toll lines.

Two-party divided ringing is provided for but the ringing equipment has not been placed on the framework because of the possibility of vibration or noise. This portion of the equipment can be placed in a remote spot.

Accessibility for Inspection.

The extreme accessibility of all parts of this switchboard makes the inspection and maintenance of the unit a relatively simple matter. The rear portion of the cabinet, which is one piece (both back and sides), is entirely removable.

The relays, which are protected by individual pressed-steel covers, face toward the back of the board and can be easily reached. All wiring and connections of the relay frame are visible from the operator's position. A cover for the front of the relay frame, finished to match the switchboard cabinet, can be furnished, when desired.

The service which this switchboard provides meets with every requirement of the size of community for which it is intended. Service features, which might be important on a larger board, have been included in this unit to reduce both the first cost and the maintenance charges.

Actual operating experience has shown that in a great majority of cases feature service is not required in communities of the size for which this switchboard is intended. The superiority of this common battery service over former magneto service looms so large that any additional service advantages, which might be had by adding features, would not offset the expense and complexity which they would add to the unit.

Every detail of the new design has been carefully planned from the viewpoint of actual operating conditions as they exist today in small exchanges. Where, heretofore, the magneto service has been handled on a contract basis, this arrangement can be continued with the new switchboard, for there is nothing so technical about the operation or maintenance of this unit that it cannot be easily understood or quickly learned by anyone who has operated and maintained a magneto switchboard.

Distributing Frame Construction.

The special "split-frame" construction of the distributing frame makes it possible to utilize the old protective equipment when it is desired to do so. Installation of the entire unit can be handled by virtually anyone who is at all familiar with common battery switchboards—and even by anyone who is unfamiliar with them with only a slight amount of outside help.

Lastly, and perhaps most important of all, is the unusually moderate cost of the entire equipment. The ingenuity and simplicity of the design and the absence of special engineering make it possible to produce these units on a mass production scale with resulting manufacturing economies.

The quality of service furnished by this switchboard is so extraordinarily superior to that of magneto equipment that it is reasonable to expect that subscribers will be more than willing to pay more for it. It is equally certain that the cost of this complete equipment is well within the financial limitations of most small telephone companies.

In the opinion of American Electric engineers, no switchboard has ever been offered which so nearly approaches the ideal small exchange equipment as does this new switchboard.

Telephone Cable in Service as Part of Pacific Coast System.

Completing two years of difficult engineering and construction work, the new $10,000,000 Los Angeles-San Francisco telephone cable was opened for service early in September, with more than 415 miles of lead-sheathed wires carrying the voice of H. A. H. Kerr, vice-president of the Los Angeles Chamber of Commerce to San Francisco in the inaugural conversation with L. W. Cutler, president of that city's chamber of commerce.

The cable is routed through the San Fernando Valley, Castaic Canyon, and the San Joaquin valley, running for more than 270 miles in underground fibre duct, which insures fast, weather-proof communication.

The new line is an important asset to Pacific Coast communication, and will eventually be one of the main links in the $30,000,000 Canada-to-Mexico cable of the Pacific Telephone & Telegraph Co., which is scheduled for completion within the next few years.

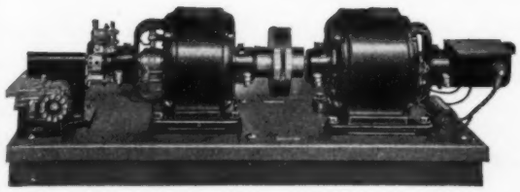
Months of trench digging, pole-setting, road-building, and cable splicing were required to complete the tremendous project. Five new buildings were constructed, making a total of 11 voice-amplifying stations on the route, located 50 miles apart to strengthen currents over the long distance telephone circuits. More than 6,000 vacuum tubes are installed in the stations.

Newfoundland Company Selects Switchboard Equipment.

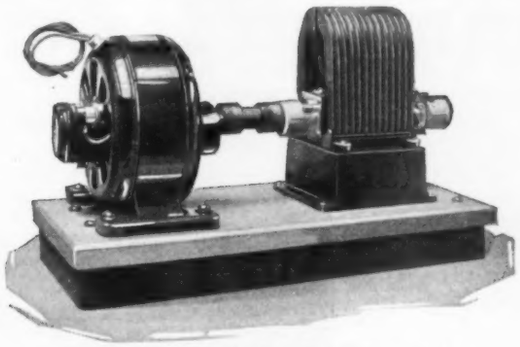
The Avalon Telephone Co., Ltd., of St. Johns, Newfoundland, has just contracted for a 700-line addition to its present switchboard and a 500-line super-service switchboard for its Belle Island exchange, with the Stromberg-Carlson Telephone Mfg. Co., according to word received from that company. R. J. Murphy is managing director of the Avalon company, and J. D. Cameron is secretary and treasurer.

HOLTZER-CABOT RINGING MACHINES

For the Efficient Operation of Your Exchange



Ringing Motor-Generator with Interrupter Attachments



"MS" Magneto Ringing Motor-Generator

Through a series of years, we have perfected this type of machinery; successfully accomplishing at the same time, a co-ordinate perfection of detail by way of attachments with which these ringing machines may be equipped.

So that, when you include in your specifications an AUTOMATIC proviso as regards RINGING, RECALL, "DON'T ANSWER", BUSY BACK and HOWLER, you may be confident of securing a—

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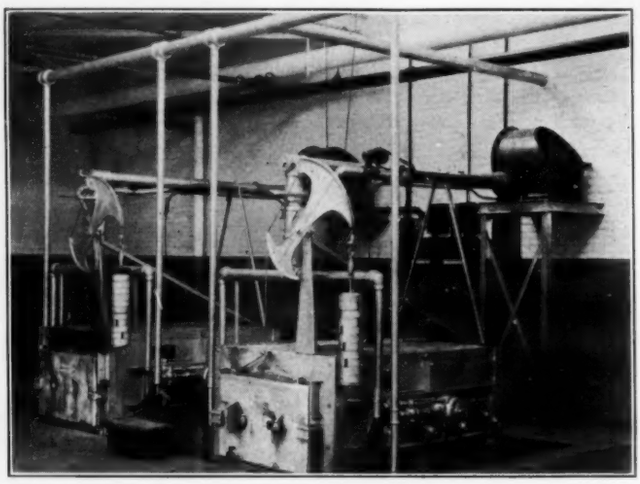
With the Manufacturers and Jobbers

Reducing Residual Magnetism in Relay Cores by Intense Heat.

One of the most important essentials for efficient operation of a telephone switchboard relay is to reduce, as much as possible, residual magnetism in the silicon steel cores of the relays. Among the latest devices employed to manufacture telephone apparatus is the surface combustion furnace, such as has been installed in the Stromberg - Carlson Telephone Mfg. Co.'s plant, in which these steel cores are annealed to reduce residual magnetism to a minimum.



View Showing Surface Combustion Furnaces Installed in the Plant of Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y., and in Which Silicon Steel Cores for Switchboard Relays Are Annealed to Reduce the Residual Magnetism to a Minimum.

These furnaces have hearths that measure 30 ins. by 60 ins. and a door measuring 18 ins. high and 28 ins. wide. They are lined with 4½-in. firebrick and tile with 2½ ins. of heat-resisting insulation.

Each furnace is fired with the modern surface combustion equipment, four burners on each side, one set firing tangentially against the roof, and the other under the hearth and from the opposite side. This assures complete circulation of the products of combustion and uniform heating.

Relay cores are packed in steel boxes and the boxes are put in air-tight annealing pots, which are sealed in fire clay. Inside the pots and around the steel boxes is placed a quantity of cast iron chips to further assure against oxidation.

The pots are then placed in the furnaces and heated to 1,525 degrees Fahr. for a period of six hours. The method used is to bring the furnace and pots up to temperature in the evening, shut off the burners and leave the furnace closed overnight. It can readily be seen that the steel cores are free from magnetism after being subjected to such heat.

In addition to being used for heat treatment of steel—annealing, hardening, normalizing, carburizing, case-hardening or tempering—these furnaces can also be used for silver, copper, zinc, aluminum and even certain types of glass ware.

Another member of the telephone switchboard which must be made exactly to specifications is the spring in the jack. Stromberg-Carlson also has installed the latest machinery designed to turn out these delicate springs.

Two steel rolls, one opposing the other and one with toothed disks to hold the blanks from slipping, form the principal part of these machines. The springs when blanked are automatically stacked in a chute, and this chute is placed on the spring machine in such a position as to feed the blanks directly into the rolls.

These rolls give the blanks the correct spring shape, and as the springs adhere to one of the rolls after forming a sharp stationary knife, strips them off so that they fall into a tote box. These machines will each form 34,000 springs per hour, which compares with a production limit of 1,500 to 1,800 per hour with the old hand-fed press.

Buried Dollars in Line Construction Work.

By Claude L. Matthews,

Vice-President and Treasurer, W. N. Matthews Corp.

Power companies the world over are burying huge sums of money each year from which there is no chance for a return.

The construction foreman of old was interested only in putting in an installation that would hold under all conditions, without the least thought of how much it cost. He was inconsistent; he would bury a six-foot or larger log and use a ⅝, ¾ or 1-inch anchor rod. Then he would guy down to the rod with light guy wire.

As the installation is no stronger than its weakest part, if any part broke it would be the guy wire. If this was the case, the foreman was clear and the responsibility was thrown on the manufacturer of guy wire. Consequently, guy wire was bought by test. Several manufacturers would submit samples; the make which was strongest in the test was purchased. The unsuccessful manufacturers would then reinforce their product and on the next test a different maker of guy wire would be successful.

Again reinforcements were made, and so on until conditions became so bad that it was necessary for all manufacturers to get together and adopt a certain standard of strength. This standardization has gone a long way toward simplifying the problems of the operating man. He now purchases guy wire of known rating and is assured of a definite performance. Standardization of this sort is certain to result in lower prices.

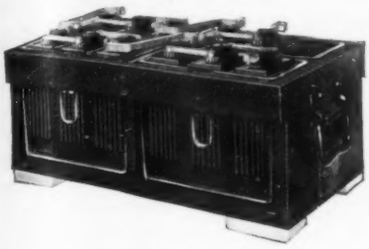
The question of strength of anchor rods is pretty well established. There are differences due to type and manner in which the eyes are made that affect their strength to some extent, but usually the rods will withstand the stresses that have been established for the various sizes and composition. The ultimate strength is readily determined from the manufacturer's printed material.

The anchor manufacturers are today in the same position as the makers of guy wire were a few years ago. So-called competitive tests are being made by various companies to determine the anchor which has the greatest holding power, in order to standardize on a particular make and type. These tests are conducted as fairly as it is possible to conduct them, but do not always give the information desired.

The purpose of a test is to determine the holding power and strength of the anchors, but in most cases at the best, this test results in an anchor rod test, as the rod is broken before the anchor can be pulled up. This shows definitely that the anchors have greater holding power and strength than the anchor rods.

The theoretical balance would be to have the ultimate strength of the anchor, anchor rod and guy strand the same. This is not practicable because anchor rods *rust* and, therefore, should be stronger than the guy strand to allow for depreciation. The anchor itself will not deteriorate sufficiently to affect its strength or holding power, provided it is made of the proper material. It is believed that the anchor rod should be the strongest.

What happened after the tests made on the various guy wires has happened to guy anchors. The manufacturer whose anchor did not show up as strong as another make reinforced his anchor and on the next test beat the other fellow. This has happened several times until now the rods are breaking instead of the anchor. It is



The 11-cell Exide type BTE is a compact and durably constructed Battery. Low gravity electrolyte greatly prolongs its life.

A NEW Addition to the EXIDE Line

At the Chicago Convention you can see the new Exide, type BTE Battery. This battery was particularly designed for such telephone services as magneto, PBX and small common battery switchboards.

At our Booth you will also find other types of Exide Batteries which have been dependably serving the telephone industry for the past 35 years.

No matter what your telephone battery job there is an Exide that will handle it dependably and economically for a long period of time.

A 2-cell tray of Exide - Ironclad Battery, type BI-5.

A typical cell of an Exide Battery of the Chloride type.

In Booth No. 41

An Exide representative will be glad to show and give you full information and literature about the new BTE type, as well as any other Exide Telephone Battery. If you have any special telephone battery problems our representative will be glad to discuss them with you.

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TELEPHONE BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Rebuilt Western Electric Co. EQUIPMENT

1020-AL desk stands complete with new heavy cords, etc.	$4.50
No. 323 and No. 329 insulated type transmitters	1.00
Complete with back and bolt . . .	1.15

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certainly time to call a halt and adopt some definite specifications.

The continual increase in strength has caused a corresponding increase in the cost of the anchors, and this has been done without any particular benefit to any one concerned.

Criticism of the present condition without offering a way out would be useless. Therefore, the following suggestions are offered:

The ultimate strength of the anchor will be the same as that of the breaking strain of the size of guy strand with which the anchor is to be used.

The recommended strain for any anchor to be one-half the ultimate strength of the guy wire to be used with it; for example, 6,000-pound guy strand is to be used. The strain that is to be put on it is 3,000 pounds. The anchor that will hold 6,000 pounds is safe for this strain and will cost much less than one that will hold several thousands of pounds more.

The question of holding power is not as easily disposed of as the anchor strength, as it is dependent on the ground conditions over which we have no control. It is generally known that certain types of anchors have greater holding powers in certain ground than others. It is impossible to get one type of anchor that will be the best for all kinds of ground.

The screw type anchor is the most universal. It will hold in most any kind of ground and can be installed in marshes, under water, in quicksand and dry, loose sand, where it is too costly to install an anchor requiring the digging of a hole.

It is feared that some operating men have greatly overestimated the strain on their guys. Many would be surprised by measuring the strain on what they would consider a heavy pull, for it is rare that strains in excess of 10,000 pounds are experienced, the majority being below 5,000 pounds. So why put in an expensive installation when a cheaper one will do the work?

The question of guy anchor location should be given more thought, and it should be remembered that the farther away from the pole that the anchor is installed, the less will be the strain on the anchor, anchor rod and guy strand.

It is hoped that in the near future something will be done toward adopting a standard for the anchor manufacturers to follow in order that this useless waste may be eliminated.

Ingenious Meter to Measure Frequency of Ringing Current.

The Ekko Co., Daily News Plaza, Chicago, Ill., has just developed a very ingenious frequency meter, called the Ekko comparison frequency meter. As its name implies, this is a meter to measure the frequency of an alternating current, by comparing the unknown frequency to one that is very accurately known.

It may be used to measure accurately the following frequencies: 16, 16⅔, 20, 25, 30, 33⅓, 42, 50, 54, 66 and 66⅔, at voltages ranging from 80 to 150. Any frequency within this range can also be measured by interpolating very simply. Hence the primary purpose of this meter is to enable the adjustment of the frequency of ringing currents in telephone systems.

If an harmonic pole-changer is used, the instrument will also indicate when the contact points are dirty or pitted and should

The Ekko Comparison Frequency Meter for Checking Frequency of Ringing Current.

be cleaned or replaced. One special instrument is made for use on 50 volts to measure and adjust 20-cycle lines.

The instrument is simply a stroboscope, run by a synchronous motor so that the disk on which the dots are printed always turns at a fixed and pre-determined speed. The frequency of the current supplied by the power companies is now accurately held at 60 cycles for operation of synchronous clocks, and this frequency determines the motor speed.

The frequency to be measured is applied to a neon lamp, of the cathode glow type, one electrode of which glows on each half-cycle. These light impulses beat visually against the moving row of dots, so that, given a certain number of dots passing a point in a certain length of time and an equal number of light impulses from the lamp, the dots appear to be standing still.

The instrument must be able to operate on a wide range of voltages, so a transformer is used to apply in all cases at least the voltage necessary to light the lamp. A ballast resistor limits the lamp current at the higher voltages, as the lamp has a negative resistance coefficient. Careful design is called for in this transformer as it must also operate on a wide range of frequencies, without drawing too much current from the line at the lower frequencies and heating objectionably.

A diffuser of etched glass is provided between the lamp and the disk to spread the light over the disk so that the operator will not have to move around to get the row of dots he wants between his eyes and the lamp. The instrument will operate in any position. No injury will be done to either the motor or the lamp, by connecting both or either to the current supply without starting the motor.

The consumption of the instrument is about two or three watts for the motor and for the lamp about .1 watt at 80 volts 66 cycles, and about four watts at 150 volts 16 cycles. The instrument is very rugged from the standpoint of the usual meter, but of course should not be abused. The life of the motor is many years, operating 24 hours a day, and it needs no oiling or attention. The life of the lamp is several thousand hours and also requires no attention.

A New Type Treated Pole for the Telephone Field.

Any present-day discussion of pole line construction is almost certain to include the mention of a type of pole that in all parts of the country has come rapidly to the front. This is the full-length, pressure-treated ZMA (zinc meta arsenite) pole.

The process for treating with ZMA and the preservative itself are the invention of the Western Union Telegraph Co.'s laboratories under the supervision of that organization's chemist, Dr. L. P. Curtin. It is a salt treatment claimed to be practically insoluble in water or ground conditions, and a positive resistant to fungus and termites that attack unprotected wood.

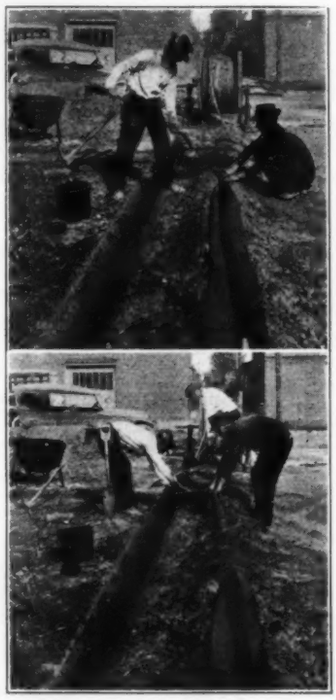
Various kinds of wood treated with ZMA were used and experienced with under every possible actual and laboratory condition by the telegraph company for some years before there was any attempt made to commercialize the invention.

In 1927, however, the Curtin-Howe Corp. was formed to manufacture the preservative and to license certain carefully selected pressure-treating plants to use it commercially. This license restricts ZMA to those plants agreeable to extremely close cooperation with the management of the Curtin-Howe Corp., one of its chemists being assigned permanently to each of the licensed plants. Most of the licensed plants being operators in Southern yellow pine, it is this pole that is most generally associated with ZMA, although in the West and in Canada its use in the treatment of other woods is well known and ZMA cedar, fir, lodge pole pine and Western yellow pine poles are now available.

The Independent telephone industry, of course, was among the first to be approached on the subject, for although ZMA treated wood is suitable for many uses,

Ever-Protect Cable Compound

Effective in maintaining your underground and aerial cable in perfect condition.



Easy to Install . . .

Ever-Protect when used for underground cable makes it necessary to use conduit. Through its use, corrosion and deterioration of cable sheath by chemical action are eliminated.

Prevents depredation by rats—dampness due to defective wiping of joints. It's flexible. It's lasting.

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Obtain

Accurate Knowledge
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MESSENGER
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Guy Line Tension

Just clamp instrument on the line at any part of the span either before or after placing aerial cable and read the tension.

Weight, 11½ lbs. Easily carried anywhere. Any tension up to 16,000 lbs. and on lines from ¼-in. to ¾-in. in diameter without guess work can be determined instantly.

with

Martin-Decker
"Shunt Type"
Tension Indicator

A few of many uses:

To check tension on suspension strand before or after aerial cable is placed. Determine guy line strain on anchors. Adjust load proportionately on two or more guys on the same pole. Determine type and size of guy anchor best suited to various soils.

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quite naturally one of its widest fields would be in the preservation of poles. The telephone companies have apparently been quite agreeable to the adoption of this type of pole, and in many cases have cooperated with local power and light company engineers and chemists in investigating its merits.

The manufacturers of ZMA claim several interesting advantages over the older and better known process of creosoting. In the first place, they refer to the matter of weight. The ZMA process leaves only dry crystals of preservation in the cells of the wood, adding theoretically but one-fourth pound of weight per cubic foot to normal dry wood. Creosote, of course, adds whatever weight is specified by the buyer, usually 8 or 12 pounds per cubic foot. The difference in weight reduces freight costs, and also the expense of handling by yard and construction crews, it is claimed.

Aside from the advantages incident to weight, cleanliness and the features closely related thereto are stressed. ZMA is said to leave the pole to all outward appearances in its original natural state. It can, therefore, be painted if desired, and can be handled by workmen or brushed against by pedestrians without any possibility of soiling or injuring clothing or the human flesh.

Of course, there have been numerous questions asked about this preservative, as there naturally are many angles to be considered regarding poles. Among the most important questions are the matters of corrosion to pole line hardware, conductivity of electricity, permanence in the wood, and whether the treatment affects the strength of the wood fibers. All of these have been investigated by numerous tests, both in actual service and in the laboratory, and all results are said to be favorable to the use of ZMA as a pole preservative.

Statistics show that the use of ZMA is increasing at a rapid rate. The Independent telephone industry, being at all times on the lookout for possible improvements and economies, is very properly cooperating to a large degree in this growth.

Stromberg-Carlson Radio Set at National Convention.

As a feature of its exhibit at the National telephone convention, the Stromberg-Carlson Telephone Mfg. Co. will give away one of its No. 10 radio receivers. Last year that company gave away one of its No. 641 table models.

The No. 10 receiver employs three UY-224 screen grid tetrodes in a new design of radio amplifier, giving uniformly high selectivity with uniformly good audio quality at all tuning positions of the selector dial. The sensitivity also is uniform for the whole range of the tuning dial and is as high as practicable for a broadcast receiver.

The No. 10 Stromberg-Carlson Radio Set.

The radio amplifier uses five tuned circuits as well as an untuned broad-band stage. Four of these tuned circuits are used in two bi-resonators, while the fifth is used to connect the radio amplifier to the high-level detector. The detector employs a screen grid tetrode which is coupled to the single stage, push-pull 245 output tubes by means of a special extra large transformer for insuring correct tone quality.

The No. 10 cabinet is an open-faced design with a center panel of walnut, decorated with a classical Karvart design and ornamental grille opening at the bottom. The cabinet is 43 ins. high by 27 ins. wide and 16⅜ ins. overall.

Strowger Exhibit at Victoria, B. C., Demonstrates Dial Working.

At the fair recently held in Victoria, the capital city of British Columbia, Canada, the British Columbia Telephone Co. had a very interesting exhibit of Strowger dial telephone equipment.

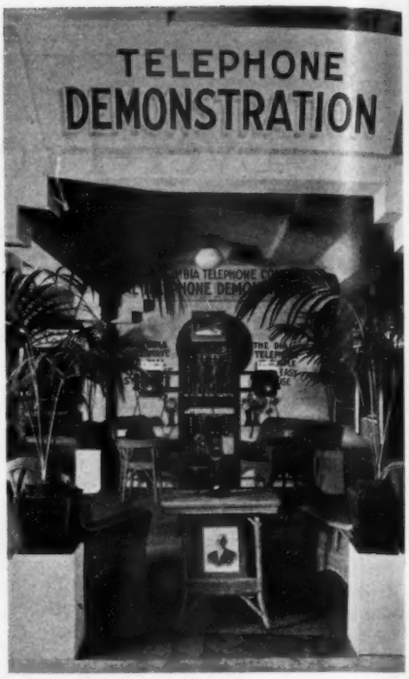
The exhibit was attended by a group of young women who demonstrated the operation of the dial and the working of the automatic equipment; 14,000 lines of this equipment have recently been installed in Victoria. The throngs which visited the booth wished not only to learn the correct dialing procedure, but were also highly interested in viewing the action of the switches which now take the place of human operators in the exchanges.

The photograph visible in the foreground of the exhibit space, is that of R. B. McMicking. Mr. McMicking established the first telephone service in this locality in 1880, and for 34 years was manager of the Victoria office of the company.

Frank L. Eldridge Co., New Distributing Organization in Chicago.

Under the name of Frank L. Eldridge Co., Frank L. Eldridge, well known in the telephone sales field, has opened an office at 11 South La Salle street, Chicago, where he will distribute dry batteries and other products to the telephone and railway field through jobbing organizations and telephone equipment manufacturers.

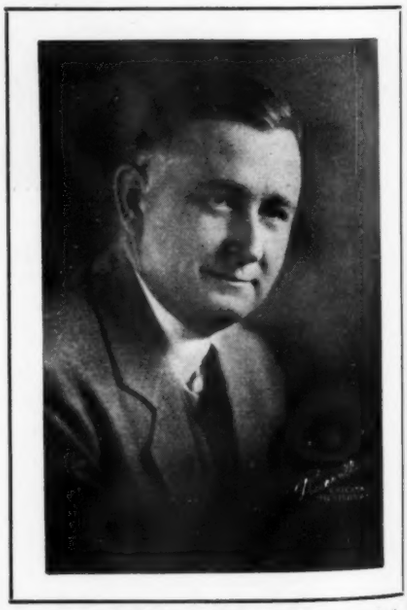
Mr. Eldridge has been engaged in promoting the sale of dry batteries for the past 11 years, and from his new office in Chicago will distribute the well-known products of the French Battery Co., Madison, Wis. In connection with this activity,



View of Strowger Dial Exhibit of British Columbia Telephone Co. at Fair Held in Victoria, B. C.

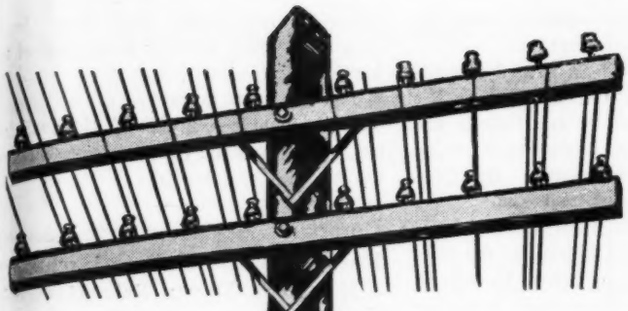
he will also act as distributor for other well-known products extensively used in the telephone field.

For some 25 years, Mr. Eldridge has been engaged in the telephone field, the past 15 of which have been devoted to sales work. His many friends throughout the industry will be glad to learn of his new



Frank L. Eldridge, Head of the Frank L. Eldridge Co., Chicago, Which Will Distribute Products of the French Battery Co. and Other Telephone Facilities.

association and wish him well in this activity. His address at 11 South La Salle street, Chicago, friends will recall, is the same as that he formerly had for several years. He invites friends to call on him whenever they may be in Chicago.



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Pine Poles *Cross Arms*

Timbers Crossties Piling

A New Comparison Frequency Meter

Portable, Rugged, Inexpensive

Frequencies may be determined accurately and quickly to within 1/100 cycle.

May be operated in any position.

Especially adapted to telephone ringing circuits.

The new Ekko portable comparison frequency meter is a stroboscope operated by a synchronous motor which cannot get out of step with the alternating current supply. The frequencies to be measured are indicated by a neon tube operated through a transformer designed for a wide range of voltages and frequencies (16 to 66⅔) and 80 to 150 volts. It measures directly the following frequencies: 16, 16⅔, 20, 25, 30, 33⅓, 42, 50, 54, 66 and 66⅔. Any frequency within these limits may be computed from the meter with great accuracy.

A special model is made for use on 50 volts for measurement of 20 cycles.

The meter is housed in a neat wooden case approximately 10"x10"x6", and weighs approximately 10 pounds.

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What the Commissions Are Doing

Up-to-the-Minute News Regarding the Activities of State and Interstate Commissions, Courts and City Councils in Matters Concerning Telephone Companies—Summary of Commission Orders and Schedule of Telephone Hearings

Purchase of Iowa Company Ruled on by State Supreme Court.

The suit of the Davenport & Tipton Telephone Co. and the Utilities Holding Corp., taken to the Iowa Supreme Court a few months ago from Cedar county, heard by Judge Atherton B. Clark of Cedar Rapids, was affirmed on September 22 by the high court.

The case concerns the purchase of the Davenport & Tipton Independent Telephone Co. by W. J. Brownel for the Utilities Holding Corp. The suit was against Pearl M. Chapman, wife of H. R. Chapman, who had signed the option with W. J. Brownel and who died a month later. It was an action for return of $1,000 paid for the option and $498.34 costs for auditing the books of the telephone company.

The lower court found for the plaintiff for the $1,000 but allowed a motion for a new trial on the attempt to collect the bill for auditing the books. The Iowa Supreme Court affirmed the decision of the lower court.

The suit was filed when it was reported that instead of only 130 shares of common stock and 16 shares of preferred stock, all owned by H. R. Chapman, there were 1,300 shares of common and 160 shares of preferred stock, some owned by other persons. It was also disputed as to the actual annual income of the company.

Nebraska Rate Increase Order Appealed to Supreme Court.

For the first time in years an appeal has been lodged in the Nebraska Supreme Court from a telephone rate increase order of the Nebraska State Railway Commission. The appeal has been filed on behalf of the chamber of commerce at Seward by C. F. Barth, attorney, and Harry Cummins.

The Lincoln Telephone & Telegraph Co. had asked for the increase, and has put into commission a new exchange, housed in a new building and giving automatic service. The greater part of the patrons signed a consent petition, but later a town row broke out, and the two factions clashed at the hearing.

The commission found that even if the manual service had been continued, there would have to be a substantial increase in rates as the company was only breaking even under the old schedule. At the hearing an effort was made to claim for the exchange a larger allocation of toll revenues than was credited to it.

Citizens of the town, aggrieved at the action of the commission, raised money to finance an appeal to the supreme court, the law permitting this direct action.

The complainants allege that the order of the commission is not sustained by the evidence offered; that its conclusions are contrary to law; that there were errors committed during the hearing that resulted in disadvantage to protestants; that the commission erred in refusing to receive certain testimony offered by the protestants; that it erred in failing to require the company to furnish certain evidence and information asked for by the protestants; that the commission erred in refusing to give them time to properly prepare for trial and refused continuance asked for.

Members of the state commission express satisfaction over the fact that the appeal has been taken. After most increases in rates that have been made in the past, the opposition has contented itself with newspaper and oral criticisms of the commission's conclusions. Now that the supreme court is to pass on this one, they feel that the situation in the future will be cleared, since the court will lay down certain principles that govern rate decisions.

The evidence, it was said, would have justified higher rates, as the new scedule does not give the average return on capital invested.

Ohio Commission Approves New Rates for Marion Area.

Approval has been given by the Ohio Public Utilities Commission to the telephone rates of the Marion exchange area of the Ohio Associated Telephone Co. proposed in accordance with the commission's order of several weeks ago that the new rates provide a refund of $112,000 to customers for the period between August 1, 1925, and December 21, 1928.

The refund was ordered as a result of the company having collected increased rates under bond under the old Pence law, the rates being based on a higher property valuation than the commission found to have existed. The rates include the following:

Inside the corporate limits of Marion: Residence, individual line, $2.75 and $3 a month; four-party line, $2.25 and $2.50 a month; business, individual line, $5.75 a month; two-party line, $4.25 a month.

Outlying territory: Business, 10-party line, $3.25; residence, 10-party line, $2.25.

The Marion County Telephone Co., predecessor of the Ohio Associated Telephone Co., on March 30, 1925, applied for advanced rates. Collection of the advanced rates under bond was begun August 1, 1925, pending disposition of the application.

The rates just approved are an increase over those preceding March 30, 1925, but are lower than the proposed rate collected during the bond period.

Company Authorized to Increase Rates at South Dakota Exchanges.

The South Dakota Railroad Commission recently approved applications of the Central West Public Service Co. for authority to increase its rate schedules at Kimball, Irene, Parker, Volin, Wakonda, and Woonsocket in South Dakota. The Central West company, which has its headquarters in Omaha, Neb., furnishes telephone service to approximately 200 towns, the majority of which are located in South Dakota, Minnesota and Iowa.

At Kimball the company furnishes magneto service to 160 town subscribers. Having no rural lines, it furnishes service to 231 switched stations. The company's property was inspected by the commission's engineer previous to the hearing, and an appraisal made. From the evidence presented, the present rates were found to be inadequate to cover operating expenses.

The company was authorized to place in effect on October 1 the following monthly net rates: Business, one-party line, main station service, $2.50; residence, one party-line, main station service, $1.75; business extension, wall type, $1; business extension, desk type, $1; residence extension, wall type, 50 cents; residence extension, desk type, 75 cents. Gross rates for business one-party line and residence one-party line service are 25 cents higher than net rates. A discount of 25 cents is allowed if the charge is paid on or before the 15th of the month in which it is due.

The Central West Public Service Co. furnishes magneto telephone service to 134 town subscribers at Irene, S. D., and to 266 rural subscribers. The plant at Irene was formerly owned by the Tri-County Farmers Telephone Co. and was sold by this company to the Dakota Public Service Co. on November 1, 1926. The property was later sold to the Central West Public Service Co.

At the hearing, the commission asked for a report of the value of the property at Irene, and the estimated book cost was given as $25,608. The commission's engineer made an inspection and inventory of the property, and testified at the hearing that aerial cable was placed in the year 1926, and that considerable underground cable was placed at a later date. An ex-

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amination of the records on file showed that approximately 4,300 feet of cable were placed during 1924, prior to the acquisition of this plant by the Dakota company.

After considering all the evidence presented, the appraisals submitted by the commission's engineer, the amount paid for the property, the net additions since this sale, the type of service furnished, the age of the various parts of the plant, and the "going concern value," the commission found that a fair value of the property used in rendering service at the Irene exchange was $35,000 instead of $25,608 as given by the company.

Considerable repairs have been made since the property was acquired by the Central West Public Service Co. Some of the wire is badly rusted and a few cases of rural trouble have been reported, which the company proposes to take care of in the near future. After careful consideration of the entire record, the commission gave the company permission to establish and put into effect October 1 the following monthly net rates:

Business, one-party line, main station service, $2.50 (gross rate, $2.75); residence, one-party line, $1.75 (gross, $2); residence, two-party line, $1.50 (gross, $1.75); rural stations, grounded circuit, $1.50 (gross, $1.75, payable quarterly in advance); business extension, wall type, $1; business extension, desk type, $1; residence extension, wall type, 50 cents; residence extension, desk type, 75 cents.

At Woonsocket, S. D., the Central West Public Service Co. furnishes magneto service to 266 town subscribers. There are no rural lines connected with this exchange. About two years ago, the office at Woonsocket was completely destroyed by fire, together with nearly all of the central office equipment. Both office and equipment were entirely replaced. There was also a considerable replacement of open wire with cable, as well as the resetting of a number of poles. The total charges to plant were $29,845. The total value of the property used in rendering service in Woonsocket is estimated at $26,500 by the commission's engineer.

After considering the facts presented at the hearing, the commission found the present rates are inadequate to pay operating expenses and taxes, and that the Central West Public Service Co. is entitled to certain increases. The company was authorized to put into effect October 1 the following monthly net rates:

Business, one-party line, $3 (gross rates, $3.25); residence, one-party line, $1.75 (gross, $2); business extension, wall type, $1; business extension, desk type, $1; residence extension, wall type, 50 cents; residence extension, desk type, 75 cents.

The schedule of rates approved by the South Dakota commission for the exchange at Parker of the Central West Public Service Co. will also be put into effect at Volin and Wakonda. At Parker the company furnishes magneto service to 348 town subscribers and to 290 rural subscribers. Magneto service is furnished to 57 town subscribers at Volin and to 167 rural subscribers. At Wakonda the company furnishes magneto service to 136 town subscribers and 246 rural subscribers.

Gross expenditures in excess of $20,000 were made during 1929 in improving the plant at the Parker exchange. Without improvements, the plant would soon have been entirely unfit to render any telephone service, according to reports submitted to the commission. The exchange at Volin is badly in need of repairs at the present time. Rural lines are practically all old, much of the wires and many of the poles being the same as were placed when the plant was originally constructed in 1903. A considerable amount of wire is rusty and many poles will soon need replacing.

The telephone plant at Wakonda was started in 1903, according to the records. Since that time the outside plant within the town limits has been rebuilt and underground cable substituted for open wire. A considerable portion of the rural plant is that which was installed originally. The rural lines are not in good condition and considerable trouble is being experienced at the present time in the service furnished.

The South Dakota commission, in view of the evidence presented at the hearings, authorized the Central West Public Service to establish the following monthly net rates at its Parker, Volin and Wakonda exchanges: Business, one-party line, $2.50 (gross, $2.75); residence, one-party line, $1.75 (gross, $2); rural stations, grounded circuit, $1.50 (gross, $1.75, payable quarterly in advance); desk sets, 25 cents; extension sets, talking, 50 cents; extension sets, talking and ringing $1; extension bells, 25 cents.

Telechronometer Order of Washington Commission Attacked.

Revealing the backbone of their case in a withering attack against the Washington Department of Public Works, proponents of the telechronometer system of metering telephone service at Everett, Wash., virtually closed their main arguments during review proceedings which opened on September 23 before Judge John M. Wilson of the Thurston County Superior Court.

The proceedings were instituted by the American Telechronometer Co., owner of the patent rights to the devices. The company obtained a writ of review, on which arguments were heard on September 23, in an effort to win a reversal of a department of public works decision ordering the West Coast Telephone Co. of Everett to discontinue use of the telechronometers by October 1, 1930.

Counsel for the telechronometer company limited their arguments almost entirely to an attack on the department's or-

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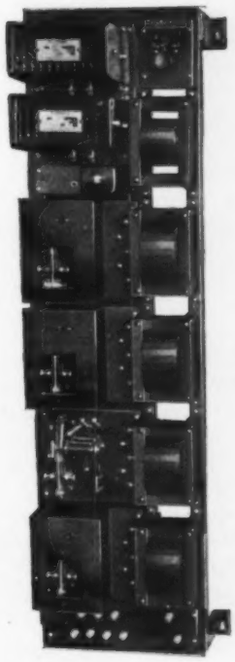

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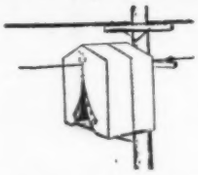

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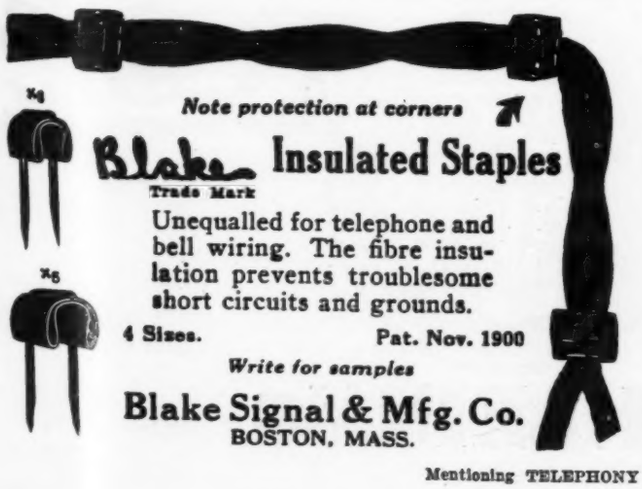

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der, which they charged was illegal, political in character and set up statements and figures in direct contradiction to undisputed evidence in the department's own record of hearings and investigations conducted since the telechronometer case began in 1926.

Indiana Company Placed in Involuntary Receivership.

The Midwest Telephone & Utilities Co., of Petersburg, Ind., was placed in the hands of a receiver on October 4 on the petition of the Telephone Construction & Distributing Co., of Petersburg, which filed a suit against the company on a claim of $9,900. The company for which a receiver is asked recently absorbed the holdings of the Pike County Telephone Co., one of the largest Independent companies in the southern part of the state.

Judge John L. Sumner in circuit court appointed the Peoples Loan & Trust Co., of Petersburg, as receiver. Assets of the company are placed at $560,000. There is $100,000 in preferred and common stock outstanding and a $400,000 bond issue.

The Midwest Telephone & Utilities Co. operates exchanges in Petersburg, Winslow, Otwell, Velpen, Union, Hazelton, Decker, Frichton, Wheatland, Alfordsville, Montgomery, Glendale and Epsom, all in Indiana.

Pay Stations Not Subject to Alabama License Tax.

Pay telephone stations are not subject to the state license tax in Alabama on nickel-in-slot machines, the attorney general's office has advised the state tax commission.

Summary of Commission Rulings and Schedule of Hearings.

CALIFORNIA.

September 29: Santa Cruz Mountains Telephone Association applied for a certificate of public convenience and necessity authorizing it to operate in the vicinity of Burrell, Santa Clara County, serving the territory on both sides of the Santa Clara-Santa Cruz county line.

ILLINOIS.

October 7: Hearing at Springfield before Chairman Hadley on application of the El Paso Telephone Co. for an order authorizing the execution of its first mortgage or deed of trust to Max Smith as trustee to secure an issue of $40,000 par value of first mortgage 7 per cent bonds and authorizing the issuance immediately thereunder of $30,000 par value of the bonds.

October 8: Hearing at Springfield before Chairman Hadley on joint application of the Assumption Telephone Co. and Assumption Mutual Telephone Co. for the approval of lease of the lines of the Assumption Mutual Telephone Co. in the city of Assumption and surrounding territory in Christian county, with option of latter company for the purchase of the property by the Assumption Telephone Co.

October 8: Hearing at Springfield before Commissioner Wilson of application of the Assumption Mutual Telephone Co. for an order (1) to purchase certain property in the city of Assumption; (2) for authority to issue $9.500 of its common capital stock; (3) for authority to issue $20,000 of its first mortgage bonds.

October 28: Hearing in Chicago on petition of Stephenson County Telephone Co., Freeport, for authority to increase rates.

INDIANA.

September 17: The Pulaski County Telephone Co. filed petition for authority to issue $185,000 of 25 per cent first mortgage bonds and $90,000 cumulative preferred stock.

September 17: The Newton & Benton County Telephone Co. filed petition for authority to issue $90,000 in first mortgage bonds and $45,000 in cumulative preferred stock.

September 26: Order approved authorizing an adjustment of rates for the Moran and Rossville exchanges of the United Corp. in Clinton county.

Rossville rates were fixed as follows: Town, business, individual lines, $2.50 net monthly; party line, $2; residence, individual line, $1.75, and party line, $1.50. Rural, business, individual line, $2.50; party, $2.25; residence, individual line, $1.75, and party line, $1.50.

Moran rates are: Business, individual line, $2.50; rural, business, individual line, $2.50; party, $2.25; residence, individual line, $1.75, and party, $1.50.

October 2: Hearing in Indianapolis on joint petition of the Bremen Telephone Corp., an Indiana corporation, and Charles E. Koontz, owner of and doing business as the Bremen Home Telephone Co., for authority to purchase and sell property, for certificate of convenience and necessity, and to issue securities.

KANSAS.

September 26: Hearing at Kiowa on application of the Western Telephone Co. for permission to establish toll charges between Kiowa and Hazelton, and Kiowa and Hardtner. Such calls have been free.

MISSOURI.

September 20: The Missouri Telephone Co., authorized to issue 5,734 shares of common stock at a par value of $100 each. In its application the company said $41,400 would be sold to the Diversified Investments, Inc.

Proceeds from sale of the stock will be used, according to the petition, for reimbursement of the company treasury for expenses of installation of dial systems in Columbia and Macon.

NEBRASKA.

September 24: In the matter of the application of the Lincoln Telephone & Telegraph Co. for validation of a rate of $1.50 a month for grounded rural service and $1.75 for metallic rural service; ordered that as the rate is reasonable and the standard for services of this character, rates validated as asked.

September 28: In the matter of the application of the Lincoln Telephone & Telegraph Co. for authority to add 50 cents a month to rural service rates where six-party circuits are desired in connection with its Plattsmouth exchange; found reasonable and granted as asked.

October 1: In the matter of the application of the Cedar County Farmers' Telephone Co. for authority to increase rates 25 cents a month for city service when magneto type of service has been replaced by common battery; it appearing that the company is prepared to give the improved type of service, ordered that as an emergency exists and as the rates are reasonable, new rates shall be collected as of date of October 1.

NEW JERSEY.

October 9: Hearing in Newark on application of Sussex Telephone Co. for authority to place in effect a toll charge between the Sparta, Lake Mohawk and Newton areas and an increased rate schedule in Newton, which has been suspended pending the investigation.

NEW YORK.

September 26: Petition filed by the Schenectady, Delanson & Esperance Telephone Co. asking for permission to sell the company, equipment and lines to the New York Telephone Co. for a cash price of $18,200.

The company has about 245 subscribers in Duanesburg, Schenectady county; Wright and Esperance, Schoharie county;

Storage Battery Theory and Maintenance.

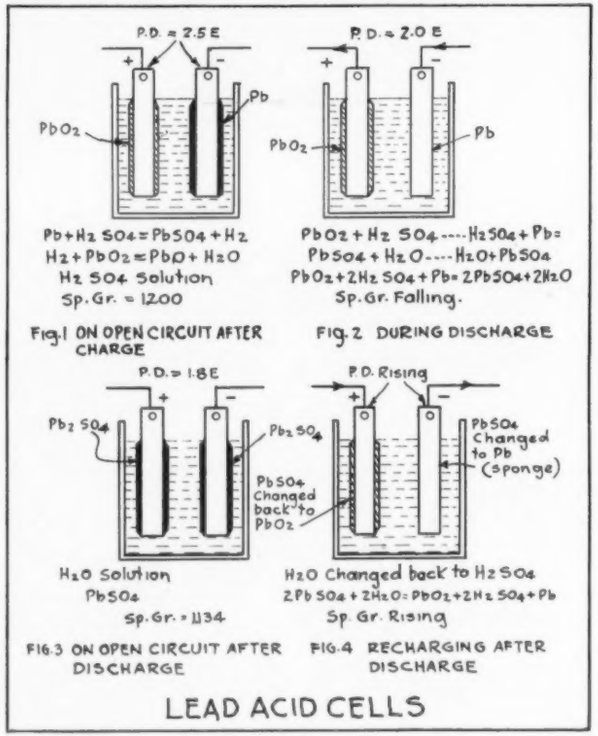
General.

Common battery plants require a 24-volt to 48-volt direct current source. Usually 24-volt potentials are used for local and 48-volt for toll. Step-by-step offices generally require 48 volts. This voltage is obtained from lead acid type storare cells. These batteries consist of either the open-glass or sealed-glass type. The sealed-glass type cell is becoming very popular, especially in the smaller exchanges and a large number of this type cell is now in use.

It has several advantages over the open-type cell, such as less loss of water due to evaporation or gassing; easy to keep clean; no dirt settling in the electrolyte.

Lead acid storage cells, Fig. 1, consist of positive plates of lead peroxide (PbO_2) (brown in color) and negative plates of sponge lead (Pb) (gray in color). These plates are immersed in a solution of sulphuric acid and water ($H_2SO_4 + H_2O$) called electrolyte.

On discharge, Fig. 2, an electrical current is produced by



the H_2SO_4 *sulphuric acid combining with the lead* (Pb) and the lead peroxide (PbO_2) forming lead sulphate ($PbSO_4$). As the discharge continues, the specific gravity of the electrolyte falls until a point is reached at which the discharge should be stopped. The lead sulphate formed on the positive and negative plates is in finely-divided form and no apparent change takes place on the plates except a slight change in color.

The net result of the discharge cycle, Fig. 3, is: A conversion of negative and positive plates to lead sulphate, a conversion of the H_2SO_4 solution to H_2O, and a gradual lowering of the cell voltage.

The following chemical equation expresses the combined reaction at the positive and negative plates:

Discharge

$$PbO_2 + Pb + 2\,H_2SO_4 = 2PbSO_4 + 2H_2O$$

Charge

On charge, a direct current is forced through the battery in opposite direction to the discharging current. This results, Fig. 4, in changing the lead sulphate $PbSO_4$ on both positive and negative plates back to lead peroxide and sponge lead respectively, at the same time converting the SO_4 portion back to sulphuric acid (H_2SO_4), Fig. 4.

The net result of the charge cycle is to reconvert the lead sulphate to Pb and PbO_2 and to change the electrolyte back to a high acid content, and to raise the cell voltage. The chemical equation is given above.

It would seem from the foregoing that the state of charge of the batteries might be determined by voltage or gravity. Generally speaking, voltage readings cannot be relied on to determine the exact state of charge. For that reason, gravity readings are used to indicate the condition of charge or discharge of a battery.

Maintenance Notes.

It is injurious to any storage battery cell to either overcharge (consistently) or to undercharge. If charging is continued after the lead sulphate has all been converted back to Pb and PbO_2, hydrogen and oxygen gas are formed. There is a tendency for this gas, which forms at the negative and positive plates, to dislodge active material which falls to the bottom of the cell, thus shortening the life of the battery.

It is usually desirable, however, to *periodically overcharge* central office batteries so that the charge in all cells can equalize, and also to prevent sulphation which results when the active material in the negative plates is allowed to stand in a discharged condition. Central office batteries which are charged daily, should be overcharged every seven to ten days. The overcharge should be a continuation of regular charge at a reduced rate, until the pilot cell shows no increase in gravity and all cells are gassing freely.

Over discharging, or allowing the battery to stand in a discharged condition, results in the $PbSO_4$ entering the pores of the plates. Such a condition will tend to make the active material hard and insoluble. A cell in this condition may not take a charge and in any event the cell capacity is reduced. This condition can generally be helped by means of a long charge at a low current rate.

The electrolyte in storage cells for central office use is usually 1.210 sp. gr. when fully charged. Charging should be started when the cells are one-half discharged. On normal charges, charge until the gravity of the pilot cell is within 4 or 5 points of the previous overcharge.

The specific gravity of the electrolyte changes with temperature. For this reason it is necessary to equate readings to some common temperature; 70 degrees is usually taken as the base. Corrections are made by adding one point for as the base. Corrections are made by subtracting one point for each three degrees below 70 degrees and adding one point for each three degrees above 70 degrees; for example, a reading of 1.200 at a temperature of 61° Fahr. would be 1.198 corrected to 70° Fahr.

The three dont's to remember in connection with lead acid batteries are: Don't overcharge, don't undercharge, and don't allow the cells to stand for any length of time in a discharged condition.

Charging Methods.

There are two methods in common use for charging central office batteries, viz: The floating and the "charge-discharge" methods. The floating method consists of continuously charging the battery but at a rate just sufficient to supply the current taken out, plus the battery losses.

If a voltage of 2.15 volts per cell is maintained (average) at all times, a battery will remain in properly charged condition. A voltage (average) in excess or lower than this will result in an overcharged or an undercharged battery.

The charge-discharge method consists in allowing a battery to discharge down to one-third or one-half, and then to charge at a fairly high rate until the battery is fully charged. The floating method is becoming very popular as it has several advantages, such as more uniform voltage, greater reserve capacity, longer battery life, less attention, etc. Where the floating method is used, the batteries can often be of a smaller size than those which would be required were the charge-discharge method used.

Rectifiers, such as the tantalum trickle chargers, or the tungar charger, are especially well-fitted for the floating method of charging central office batteries. Another method of charging, which is referred to as "semi-floating," is used to some extent in the larger exchanges. In these exchanges where a generator is used to charge the battery on the charge-discharge basis, the generator is shut down at night and the battery charged by floating it on rectifiers such as mentioned above. Advantages claimed for this method include: greater reserve battery capacity, power economy, etc.

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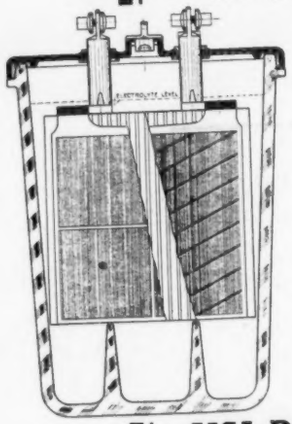

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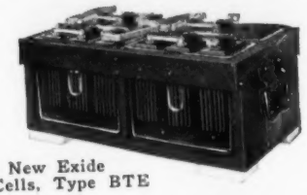

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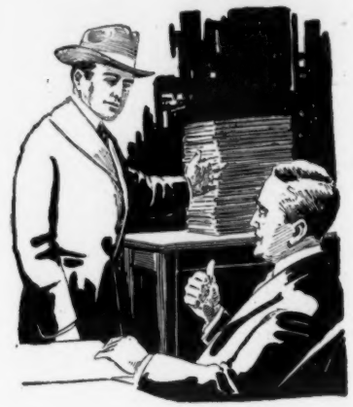

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Florida and Charlton, Montgomery county, and Knox and Guilderland, Albany county.

The company now has a toll service in conjunction with the New York Telephone Co. The petition states that the New York company is prepared to improve the service.

October 3: W. Linn Marriotte, operating a telephone line in the towns of Amboy, Parish and Hastings, Oswego county, filed petition asking for consent to the sale of the property to the New York Telephone Co. for $700. The New York Telephone Co. serves adjacent territory with a connection with the Marriotte line at Parish. Mr. Marriotte stated that he desires to be relieved of the responsibility of operating the line.

Expenditures for betterments and extensions, the petition states, are necessary and the New York Telephone Co. is in a position to make the necessary improvements. Transfer of ownership, it is also stated, is in the public interest and will be of advantage to the subscribers on the Marriotte line.

NORTH DAKOTA.

September 29: Hearing at Bismarck on petition of citizens of Beulah asking that the Citizens Public Service Co. be required to improve its telephone service.

OHIO.

September 19: Ohio Bell Telephone Co. authorized to purchase the plant and properties of the West Jefferson Home Telephone Co. for $53,625.

September 27: Approval given to the exchange rates of the Marion exchange area of the Ohio Associated Telephone Co., proposed in accordance with a recent order of the commission providing for a refund. The new rates are an increase over those preceding March 31, 1925, but are less than the proposed rates collected during the bond period.

October 23: Hearing at Columbus on appraisal of equipment of the New Concord Telephone Co., of New Concord. The commission appraised the equipment much lower than did the company. The hearing is being held because of a protest of the New Concord company on the commission's valuation.

OKLAHOMA.

September 20: Southwestern Bell Telephone Co. authorized to increase rates at its Elk City exchange. The rates will be increased from $3 to $4 for business telephones with 25-cent increase for party line telephones.

October 21: Hearing on application of the Western Telephone Corp. for authority to disconnect Oklahoma Rural Telephone Co. from its exchange at Marshall.

TENNESSEE.

September 25: Southern Bell Telephone & Telegraph Co. granted until October 11 to answer a petition filed by citizens of Chattanooga asking substantial reduction in telephone rates in Chattanooga and elsewhere in the state.

WISCONSIN.

October 21: Hearing at Wisconsin Rapids on petition of the Auburndale Telephone Co., asking for permission to establish a 10-cent toll charge between its exchanges at Auburndale, Milladore, Vesper, Junction City, Pittsville and Babcock. Free service has heretofore existed between these exchanges and the exchange at Rudolph.

October 23: Continued hearing on application of the Community Telephone Co. of Wisconsin for permission to increase its rates at Westfield.

Condensed Telephone News

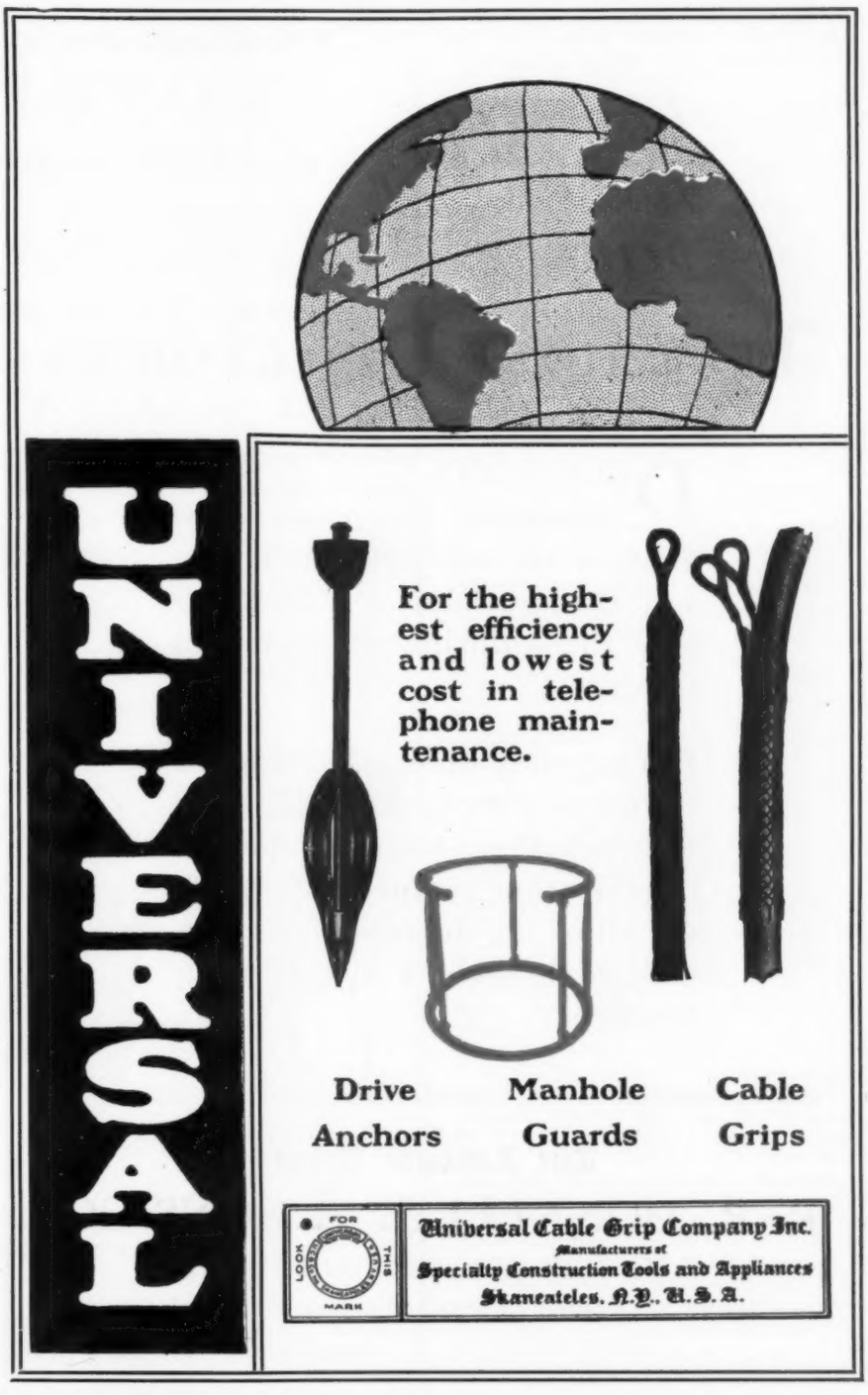
Companies Are Urgently Requested to Forward to Us Promptly News Concerning Construction, Rebuilding, Financing, Election of Officers, Sales and Purchases of Exchanges or Other Activities

New Incorporations and New Telephone Companies.

INDIANAPOLIS, IND.—Articles of reorganization have been filed with the secretary of state by the Farmers Mutual Telephone Co. of Columbia City. The corporation has an initial capital stock of 957 shares and is formed to carry on a general telephone business. The first board of directors is composed of P. F. Goodrich, R. W. Frost and J. M. Conway.

HELENA, MONT.—For the purpose of constructing and maintaining a telephone line which will cover two townships in Chouteau county, the North Busch Telephone Line has filed incorporation papers with Secretary of State W. E. Harmon, a recent report states.

The principal office of the telephone line will be at Highwood. The capital is placed at $1,500 and directors are A. W. Davidson, J. L. Davidson and John E. Hanson, all of Highwood.



Financial.

CHICAGO, ILL.—The Mid-west States Utilities Co. has increased its authorized Class A stock from 150,000 to 300,000 shares, and application will be made for approval of a proposal to have 64,000 shares presently outstanding, Lon J. Jester, vice-president, has announced. The new financing will be handled by E. H. Ottman & Co. of Chicago and associates, and has for its purpose the consolidation of properties previously acquired.

SALINA, KANS.—Western Power, Light & Telephone Co. directors have declared an extra dividend of 6¼ cents a share on the class A stock, in addition to the regular quarterly payment of 50 cents a share.

ERIE, PA.—Stockholders have voted to increase the capital stock of the Pennsylvania Telephone Co., from $5,000,000 to $10,000,000, and to issue preferred stock in the sum of $2,500,000. This increased valuation will not go out of the organization but will be used in the proposed expansion program.

It is planned to center with the Pennsylvania Telephone Co. in Erie, properties of the Associated Telephone Utilities Co. throughout Pennsylvania, and ultimately those in New York and Ohio.

PHILADELPHIA, PA.—A special meeting of stockholders of the Bell Telephone Co. of Pennsylvania has been called for December 4 to vote on a proposed increase in capital stock to $250,000,000 from $110,000,000. The increase will be in common stock, which is to be issued only as needed for capital expenditures to care for the growth of business.

Franchises.

HARRISBURG, ILL.—An ordinance granting the Illinois Commercial Telephone Co. a 20-year franchise has been passed by the city council. If accepted by the company it will be submitted to a vote of the people. The ordinance provides for an annual rental fee of 50 cents for each pole on city property in the place of $1.00, as provided in a general ordinance.

Construction.

WASHINGTON, D. C.—Application of American Telephone & Telegraph Co. for permission to lay a cable between Key West and Havana has been approved by the War Department.

CHICAGO, ILL.—Directors of the Illinois Bell Telephone Co. on September 24 approved expenditures of $2,000,032 for plant in Chicago and $1,219,511 for plant outside of Chicago. Expenditures approved so far this year total $20,118,719 .

MARTINSVILLE, ILL.—E. A. Purcell, vice-president of the Illinois Southeastern Telephone Co., has announced that plans for rebuilding the local telephone exchange will be submitted to the directors for approval. Plans call for setting 300 poles and the use of 15,000 feet of aerial cable in the city at a cost of $12,000.

WILLIAMSPORT, IND.—The Wabash Valley Telephone Co. has constructed and placed in service an additional copper toll circuit between Williamsport and Lafayette.

MARCUS, IOWA.—A new exchange building and equipment costing approximately $24,000 have been constructed and installed by the West Iowa Telephone Co. The building is composed of brick and tile.

The two-position common battery switchboard installed has an ultimate capacity of 900 local lines. The present number of telephones in operation is 300. There are 60 rural lines, and 10 toll lines. The switchboard is equipped for 10-party selective ringing for rural service.

NEW YORK, N. Y.—The directors of the New York Telephone Co. authorized the expenditure of $12,951,325 for new construction throughout the state, at the regular monthly meeting held September 24. This brings the total appropriations since the beginning of the year to $80,687,760. of which $66,108,510 has been provided for the extension of facilities in the metropolitan area.

The appropriations for Manhattan provide almost five million dollars for the enlargement of telephone facilities in all parts of the borough.

IRVING, DALLAS COUNTY, TEXAS.—A franchise has been granted the Southwest Telephone Co. by the town of Irving, which calls for the immediate erection and installation of an entirely new telephone system of the common battery type.

A new telephone building is proposed but the plans are still in the tentative stage. New poles, cables, telephones and operating equipment are called for and will be installed before the first of the year.

Irving is now limited to less than 300 telephones and three toll lines.

Miscellaneous.

CHICAGO, ILL.—The Associated Telephone Utilities Co. has purchased the Wise Telephone Co., Birchwood, and the Freeman Telephone Co., Mt. Sterling, all of Wisconsin.

FREEPORT, ILL.—Geo. X. Cannon, manager of the Stephenson County Telephone Co., recently addressed the Rotary Club.

HILLSDALE, ILL.—C. W. Schomerus was elected manager of the Crescent Telephone Co. at a recent meeting of the directors. Mrs. Lydia Sipperly, of Prophetstown, was chosen chief operator.

Josephine Fisk, manager of the office for

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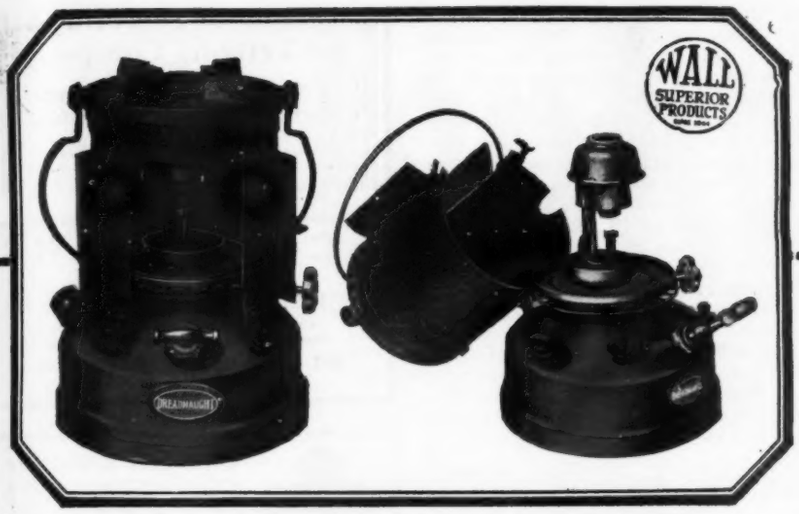

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the last seven years, will move to the farm of her brother, Courtland Fisk. Idella Jensen has been retained as second operator at the switchboard. Directors also are having extensive improvements made to the telephone lines leading into Hillsdale.

HINDSBORO, ILL.—The Hindsboro Mutual Telephone Co. has purchased the property of N. E. Powers, which will be used for a telephone office and supply place.

Officers of the Hindsboro Mutual company are Bert Creviston, president; Henry Davis, treasurer; and Bert Orr, secretary. Ralph Douglas is employed as lineman.

KEWANEE, ILL.—R. T. Maltimore of Murphysboro is the new manager of the Illinois Commercial Telephone Co. for the district including Bradford, Neponset, Buda, Elmira, Wyoming, Camp Grove, Duncan, Edelstein and Brimfield.

Mr. Maltimore has been with the Illinois Commercial company since 1922. He succeeds E. S. Slusher as manager of the company in this district.

MIDDLETOWN, ILL.—Louis Thompson, who had charge of the local exchange of the Illinois Central Telephone Co. for several years, has been transferred to Lincoln. Mr. and Mrs. Fritz Blaum will have charge of the local exchange.

URBANA, ILL.—Obeying orders of the city council, Corporation Counsel R. E. Winkleman has commenced suit against the Illinois Bell Telephone Co. to collect a pole tax of $2 per pole that he says the company refuses to pay.

ALBA, MICH.—George W. Tobias has sold his interest in Alba Telephone Co. to Lyle O. Wakeman of Almont, Mich.

LUVERNE, MINN.—A. D. La Due, secretary and treasurer of the Luverne Telephone Co., has sold his interests to the remaining members of the company, E. A. Brown, Jay A. Kennicott, and V. C. Mead.

In the reorganization of the company, Mr. Brown was re-elected president, Mr. Kennicott vice-president, secretary and treasurer, and V. C. Mead manager.

During the past three years the Luverne company has steadily increased its territory until it now has, in addition to the city system, approximately 200 miles of rural lines. These lines extend to Kanaranzi, Magnolia, Kenneth, Hardwick, Booge, Beaver Creek and Ashcreek, with branches which form a network of lines throughout the central part of the county.

NEW YORK, N. Y.—The American Telephone & Telegraph Co. has applied to the New York Stock Exchange for permission to list 150,000 additional common shares. It is believed the additional stock is to be used in connection with acquisition of Teletype Corp., which was taken over October 1.

SULPHUR, OKLA.—Frank Crawford has contracted to purchase his associate's undivided half-interest in the Sulphur Telephone Co. as the result of a deal closed September 1, but just recently announced.

A. C. Hendricks, of Lubbock, Texas, was the owner of a half-interest in the company, and by this deal Mr. Crawford becomes the sole owner. The latter hopes in the future to build a new office building, with needed equipment, in order to keep up with the progress of the town.

LEBANON, PA.—The Schaefferstown Rural Telephone Co. has been made defendant in an action in trespass filed at Lebanon asking $150 damages as the result of the death of a sorrel mare owned by Phares Eberly, Millcreek township farmer, last spring.

The statement claims that the company failed to maintain a line of poles over the

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Eberly tract and that during a storm one of the poles was blown down, carrying the wires with it. The horse became entangled in the wires and was so badly cut that it had to be killed.

HASKELL, TEXAS.—The Haskell Telephone Co. properties, including the telephone exchange at Haskell and 24 other West Texas cities and towns, was sold recently to the Associated Telephone Utilities Co., of Chicago, Ill., Texas headquarters for which are at Lubbock. The exchanges involved in the deal, in addition to the one at Haskell, are as follows: Bryson, Jermyn, Loving, Megargel, Thalia, Aspermont, Swenson, Benjamin, Bomarton, Crowell, Dundee, Goree, Holiday, Knox City, Mankins, Munday, Newcastle, Olney, Rule, Rochester, Sagerton, Seymour, Throckmorton and Weinert.

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of "Telephony," published weekly at Chicago, Ill., for October 1, 1930.

State of Illinois, County of Cook, ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared S. R. Edwards, who, having been duly sworn according to law, deposes and says that he is the editor of "Telephony" and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher, Telephony Publishing Corp., 608 S. Dearborn St., Chicago, Ill.

Editor, S. R. Edwards, 608 S. Dearborn St., Chicago, Ill.

Managing Editor, S. R. Edwards, 608 S. Dearborn St., Chicago, Ill.

Business Manager, H. D. Fargo, Sr., 608 S. Dearborn St., Chicago, Ill.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

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3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

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4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

S. R. EDWARDS,
Editor.

Sworn to and subscribed before me this 26th day of September, 1930.

(Seal) JULIA C. O'BRIEN.

(My commission expires June 12, 1932.)

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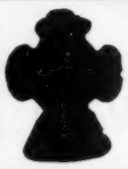
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